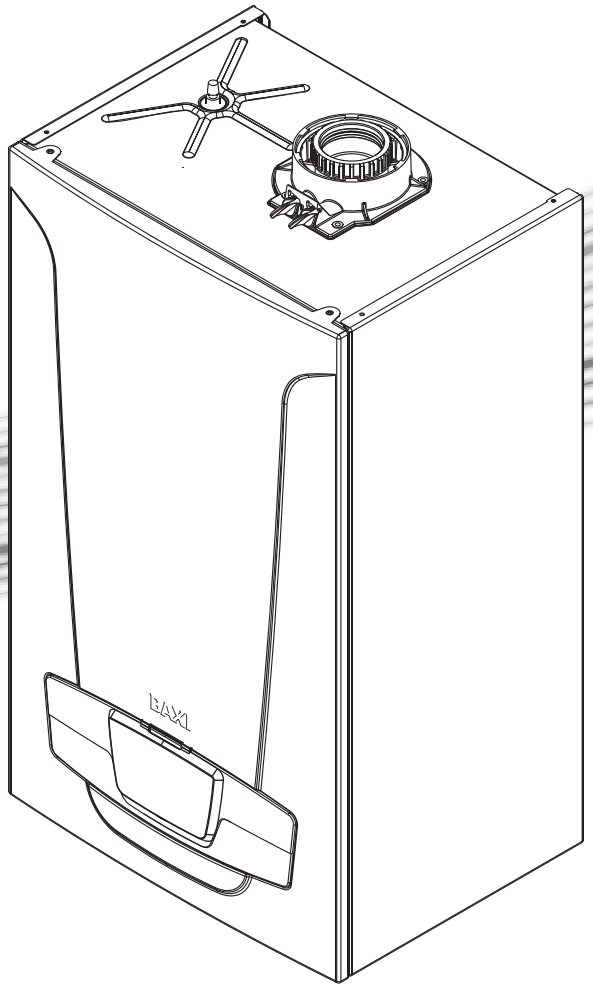
BAXI

Installation & Servicing Instructions



Duo-tec 2 Combi GA Range

Gas Fired Wall Mounted Condensing
Combination Boiler

These instructions include the Benchmark Commissioning Checklist
and should be left with the user for safe keeping.
They must be read in conjunction with the Flue Installation Guide.

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Model Range

Baxi Duo-tec 2 Combi 24 GA
G.C.N° 47-075-54
Baxi Duo-tec 2 Combi 28 GA
G.C.N° 47-075-55
Baxi Duo-tec 2 Combi 33 GA
G.C.N° 47-075-56
Baxi Duo-tec 2 Combi 40 GA
G.C.N° 47-075-57

The Benchmark Scheme

Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer's instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme. Visit **www.centralheating.co.uk** for more information.

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Full acknowledgement of author and source must be given.

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Building Regulations and the Benchmark Commissioning Checklist

Building Regulations (England & Wales) require notification of the installation of a heating appliance to the relevant Local Authority Building Control Department. This can be achieved via a Competent Persons Self Certification Scheme as an option to notifying the Local Authority directly.

The Health & Safety Executive operates the 'Gas Safe Register', a self-certification scheme for gas heating appliances.

These arrangements represent a change from the situation whereby compliance with Building Regulations was accepted as being demonstrated by completion of the Benchmark Logbook (which was then left on site with the customer).

With the introduction of Self Certification Schemes, the Benchmark Logbook is being withdrawn. However, a similar document in the form of a commissioning checklist and service interval record is incorporated at the back of these instructions.

This company is a member of the Benchmark initiative and fully supports the aims of the programme. Its aim is to improve the standards of installation and commissioning of central heating systems in the UK and to encourage the regular servicing of all central heating systems to ensure safety and efficiency.

Building Regulations require that installations should comply with manufacturer's instructions. It is therefore important that the commissioning checklist is completed by the installer. The relevant section of Building Regulations only relates to dwellings. Therefore the checklist only applies if the appliance is being installed in a dwelling or some related structure.

The flowchart opposite gives guidance for installers on the process necessary to ensure compliance with Building Regulations.

IPX5D

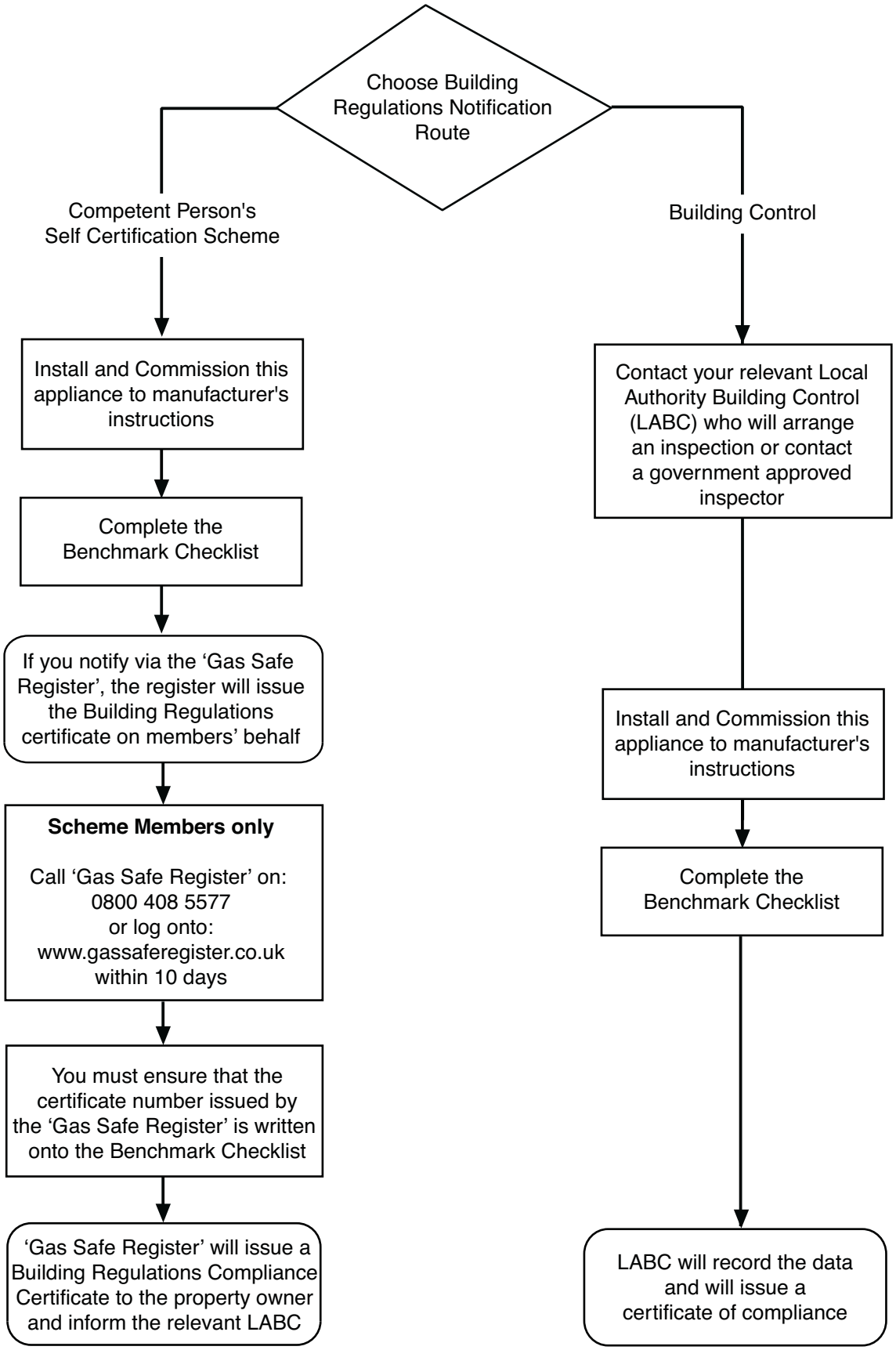
CE 0085

energy saving trust recommended
Certification Mark

WRAS APPROVED PRODUCT

benchmark COLLECTIVE MARK
THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

BSI™
ISO 9001
FM 00866


Choose Building Regulations Notification Route
Competent Person's Self Certification Scheme
Building Control
Install and Commission this appliance to manufacturer's instructions
Complete the Benchmark Checklist
If you notify via the 'Gas Safe Register', the register will issue the Building Regulations certificate on members' behalf
Scheme Members only
Call 'Gas Safe Register' on: 0800 408 5577 or log onto: www.gassaferegister.co.uk within 10 days
You must ensure that the certificate number issued by the 'Gas Safe Register' is written onto the Benchmark Checklist
'Gas Safe Register' will issue a Building Regulations Compliance Certificate to the property owner and inform the relevant LABC
Contact your relevant Local Authority Building Control (LABC) who will arrange an inspection or contact a government approved inspector
Install and Commission this appliance to manufacturer's instructions
Complete the Benchmark Checklist
LABC will record the data and will issue a certificate of compliance

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IMPORTANT - Installation, Commissioning, Service & Repair

This appliance must be installed in accordance with the manufacturer's instructions and the regulations in force. Read the instructions fully before installing or using the appliance.

In GB, this must be carried out by a competent person as stated in the Gas Safety (Installation & Use) Regulations.

Definition of competence: A person who works for a Gas Safe registered company and holding current certificates in the relevant ACS modules, is deemed competent.

In IE, this must be carried out by a competent person as stated in I.S. 813 "Domestic Gas Installations".

The addition of anything that may interfere with the normal operation of the appliance without express written permission from the manufacturer or his agent could invalidate the appliance warranty. In GB this could also infringe the Gas Safety (Installation and Use) Regulations.

Warning - Check the information on the data plate is compatible with local supply conditions.

All Gas Safe registered engineers carry an ID card with their licence number and a photograph. You can check your engineer is registered by telephoning 0800 408 5500 or online at www.gassaferegister.co.uk

The boiler meets the requirements of Statutory Instrument " The Boiler (Efficiency) Regulations 1993 N° 3083" and is deemed to meet the requirements of Directive 92/42/EEC on the energy efficiency requirements for new hot water boilers fired with liquid or gaseous fuels:-

Type test for purpose of Regulation 5 certified by:
Notified Body 0085.

Product/Production certified by:
Notified Body 0086.

For GB/IE only.

Legislation

This company declares that no substances harmful to health are contained in the appliance or used during appliance manufacture.

The appliance is suitable only for installation in GB and IE and should be installed in accordance with the rules in force, and only used in a suitably ventilated location.

In GB, the installation must be carried out by a Gas Safe Registered Installer. It must be carried out in accordance with the relevant requirements of the:

- Gas Safety (Installation & Use) Regulations.
- The appropriate Building Regulations either The Building Regulations, The Building Regulations (Scotland), Building Regulations (Northern Ireland).
- The Water Fittings Regulations or Water Byelaws in Scotland.
- The Current I.E.E. Wiring Regulations.

Where no specific instructions are given, reference should be made to the relevant British Standard Code of Practice.

In IE, the installation must be carried out by a competent Person and installed in accordance with the current edition of I.S. 813 'Domestic Gas Installations', the current Building Regulations and reference should be made to the current ETCI rules for electrical installation.

All systems must be thoroughly flushed and treated with inhibitor (see section 6.2).

Codes of Practice - refer to the most recent version

In GB the following Codes of Practice apply:

Standard	Scope
BS 6891	Gas Installation.
BS 5482 Part 1	Butane & Propane Gas Installation
BS 5546	Installation of hot water supplies for domestic purposes.
BS EN 12828	Heating systems in buildings.
BS EN 12831	Heating systems in buildings - Calculation of load.
BS EN 14336	Installation & commissioning of water based heating systems.
BS 6798	Installation of gas fired hot water boilers.
BS 5440 Part 1	Flues.
BS 5440 Part 2	Ventilation.
BS 7074	Expansion vessels and ancillary equipment for sealed water systems.
BS 7593	Treatment of water in domestic hot water central heating systems.

In IE the following Codes of Practice apply:

Standard	Scope
I.S. 813	Domestic Gas Installations.
The following standards give valuable additional information;	
BS 5546	Installation of hot water supplies for domestic purposes.
BS EN 12828	Heating systems in buildings.
BS EN 12831	Heating systems in buildings - Calculation of load.
BS EN 14336	Installation & commissioning of water based heating systems.
BS 7074	Expansion vessels and ancillary equipment for sealed water systems.
BS 7593	Treatment of water in domestic hot water central heating systems.

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General

The following advice should be adhered to, from when first handling the boiler to the final stages of installation, and also during maintenance.

Most injuries as a result of inappropriate handling and lifting are to the back, but all other parts of the body are vulnerable, particularly shoulders, arms and hands. Health & Safety is the responsibility of EVERYONE.

There is no 'safe' limit for one man - each person has different capabilities. The boiler should be handled and lifted by TWO PEOPLE.

Do not handle or lift unless you feel physically able.

Wear appropriate Personal Protection Equipment e.g. protective gloves, safety footwear etc.

Preparation

Co-ordinate movements - know where, and when, you are both going.

Minimise the number of times needed to move the boiler - plan ahead.

Always ensure when handling or lifting the route is clear and unobstructed. If possible avoid steps, wet or slippery surfaces, unlit areas etc. and take special care on ladders/into lofts.

Technique

When handling or lifting always use safe techniques - keep your back straight, bend your knees. Don't twist - move your feet, avoid bending forwards and sideways and keep the load as close to your body as possible.

Where possible transport the boiler using a sack truck or other suitable trolley.

Always grip the boiler firmly, and before lifting feel where the weight is concentrated to establish the centre of gravity, repositioning yourself as necessary. See the 'Installation' section of these instructions for recommended lift points.

Remember

The circumstances of each installation are different. Always asses the risks associated with handling and lifting according to the individual conditions.

If at any time when installing the boiler you feel that you may have injured yourself STOP !!
DO NOT 'work through' the pain - you may cause further injury.

IF IN ANY DOUBT DO NOT HANDLE OR LIFT THE BOILER - OBTAIN ADVICE OR ASSISTANCE BEFORE PROCEEDING !!

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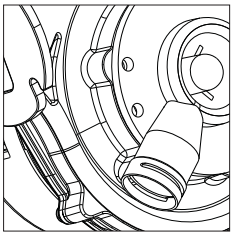

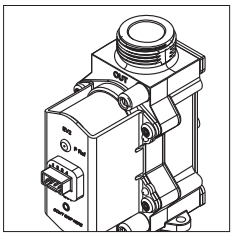

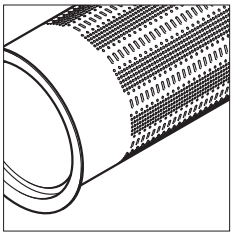

CONTENTS

Section		Page
1.0	Introduction	7
2.0	General Layout	8
3.0	Appliance Operation	9
4.0	Technical Data	10
5.0	Dimensions and Fixings	11
6.0	System Details	12
7.0	Site Requirements	15
8.0	Flue Options	21
9.0	Installation	23
10.0	Commissioning	28
11.0	Completion	30
12.0	Servicing	31
13.0	Changing Components	33
14.0	Combustion & Calibration	42
15.0	Electrical	43
16.0	Short Parts List	44
17.0	Fault Finding	45
18.0	External Low Voltage Controls	51
	Benchmark Checklist	54

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1.0 Introduction

1.1 Description

1. The Baxi Duo-tec 2 Combi GA Range are fully automatic gas fired wall mounted condensing combination boilers. It is room sealed and fan assisted, and will serve central heating and mains fed domestic hot water.

2. The boiler is set to give a maximum output of :-

24 models -	24 kW DHW
	21.2 kW CH (Condensing)
28 models -	28 kW DHW
	25.3 kW CH (Condensing)
33 models -	33 kW DHW
	29.6 kW CH (Condensing)
40 models -	40 kW DHW
	33.8 kW CH (Condensing)

3. The boiler is factory set for use on Natural Gas (G20). It can be converted to operate on Propane (G31) - see Section 10.1 'Gas Type Check'.

4. The boiler is suitable for use only on fully pumped sealed heating systems. Priority is given to domestic hot water.

5. The boiler data badge gives details of the model, serial number and Gas Council number and is situated on the inner door panel. It is visible when the case front panel is removed (Fig. 2).

6. The boiler model, serial number and Gas Council number are also shown on the information label behind the boiler control flap (Fig. 1). This is for user reference.

7. The boiler is intended to be installed in residential / commercial / light industrial E.M.C. environments on a governed meter supply only.

8. The boiler must be installed with one of the purpose designed flues such as one of the standard horizontal telescopic flue kits detailed in the Flue Installation Guide.

9. **All systems must be thoroughly cleansed, flushed and treated with inhibitor (see section 6.2).**

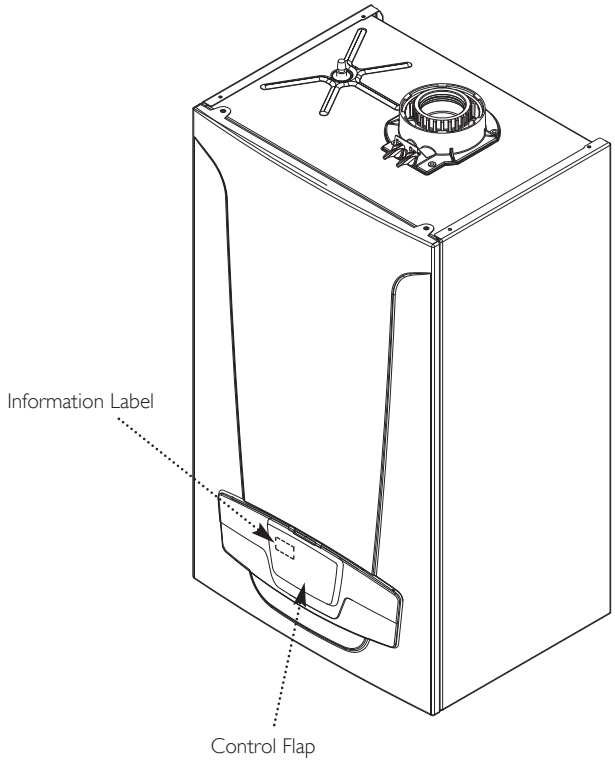

Fig. 1

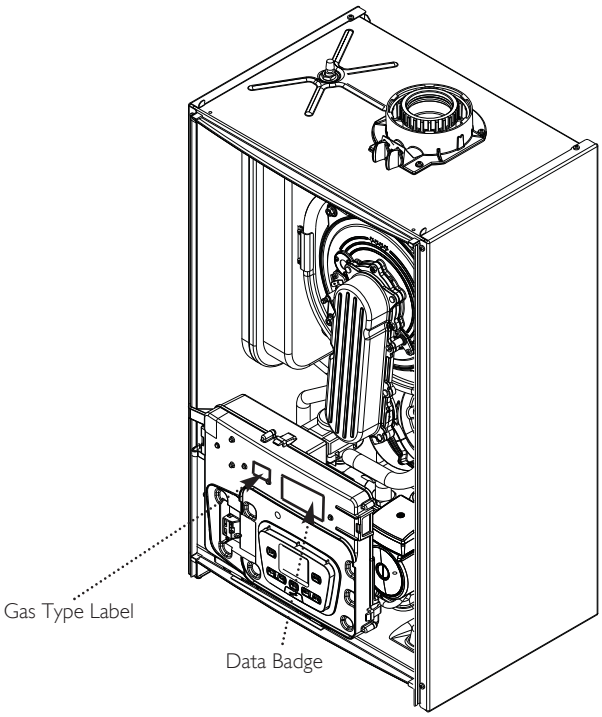

Fig. 2

1.2 Optional Extras

Various timers, external controls, etc. are available as optional extras. Full details are contained in the relevant sales literature.

1.3 Contents of Pack

The pack contains:-

- Boiler
- Wall Plate inc. Taps
- Template
- Fittings & Literature Pack

NOTE: These Installation & Servicing Instructions MUST be read in conjunction with the Flue Installation Guide supplied in the Literature Pack.

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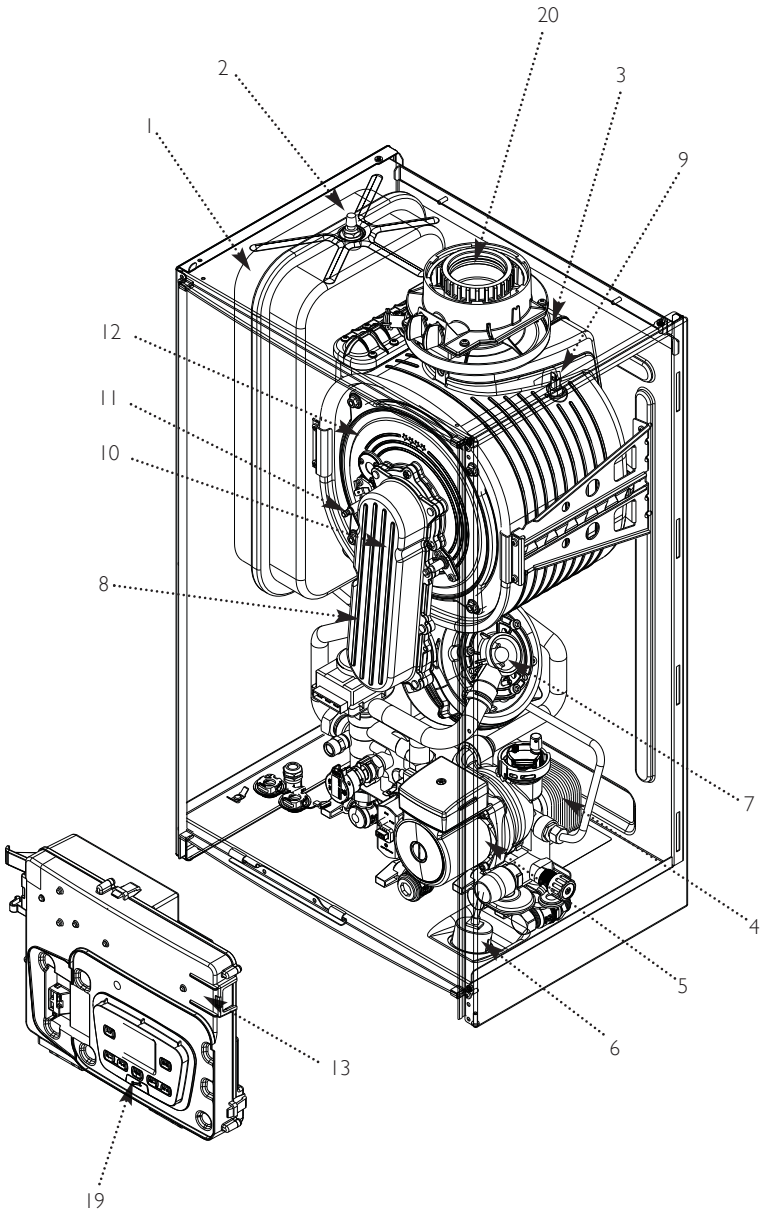
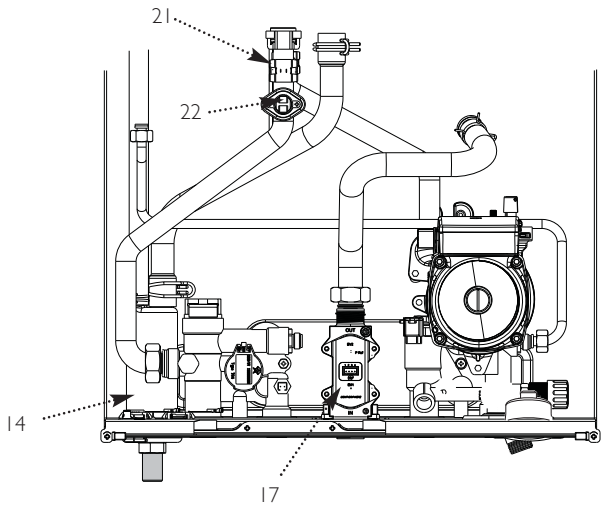
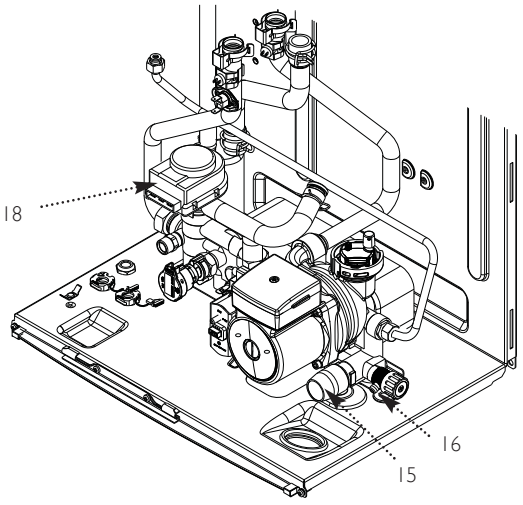
2.0 General Layout

2.1 Layout



1. Expansion Vessel
2. Expansion Vessel Valve
3. Primary Heat Exchanger
4. DHW Plate Heat Exchanger
5. Pump with Automatic Air Vent
6. Central Heating System Pressure Gauge
7. Fan Assembly
8. Air/Gas Collector
9. Flue Sensor
10. Flame Sensing Electrode
11. Spark Ignition Electrode
12. Combustion Box Cover & Burner
13. Control Box Display
14. Condensate Trap
15. Safety Pressure Relief Valve
16. Drain Off Point
17. Gas Valve
18. Diverter Valve Motor
19. Boiler Controls
20. Boiler Adaptor
21. Heating Flow Sensor
22. Safety Thermostat





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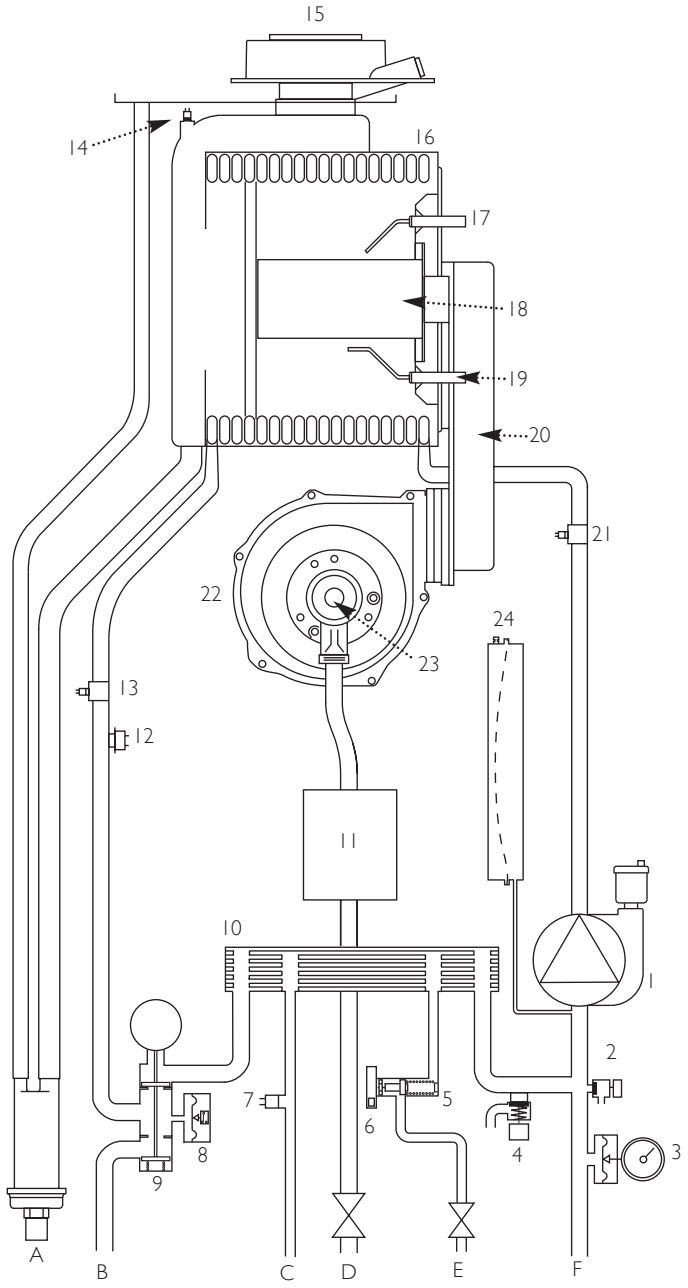

Fig. 3

Key
1. Pump with Automatic Air Vent
2. Boiler Drain Tap
3. Pressure Gauge
4. Safety Pressure Relief Valve
5. DHW Flow Sensor/Filter/Restrictor
6. Domestic Hot Water Priority Sensor
7. Domestic Hot Water NTC Sensor
8. Hydraulic Pressure Switch
9. Three Way Valve & Motor
10. Plate Heat Exchanger
11. Gas Valve
12. Safety Thermostat (105° C)
13. Heating Flow Sensor
14. Flue Sensor
15. Boiler Adaptor
16. Primary Heat Exchanger
17. Spark Ignition Electrode
18. Burner
19. Flame Sensing Electrode
20. Air/Gas Collector
21. Heating Return Sensor
22. Fan
23. Air/Gas Venturi
24. Expansion Vessel

Connections:-
A – Condensate Drain
B – Heating Flow
C – Domestic Hot Water Outlet
D – Gas Inlet
E – Cold Water Inlet On/Off Valve and filter
F – Heating Return

3.0 Appliance Operation

3.1 Central Heating Mode

1. With a demand for heating, the pump circulates water through the primary circuit.

2. Once main burner ignites the fan speed controls the gas rate to maintain the heating temperature measured by the temperature sensor.

3. When the flow temperature exceeds the setting temperature, a 3 minute delay occurs before the burner relights automatically (anti-cycling). The pump continues to run during this period.

4. When the demand is satisfied the burner is extinguished and the pump continues to run for a period of 3 minutes (Pump Overrun).

3.2 Domestic Hot Water Mode

1. Priority is given to the domestic hot water supply. A demand at a tap or shower will override any central heating requirement.

2. The flow of water will operate the Hall Effect Sensor which requests the 3 way valve to change position. This will allow the pump to circulate the primary water through the DHW plate heat exchanger.

3. The burner will light automatically and the temperature of the domestic hot water is controlled by the temperature sensor.

4. When the domestic hot water demand ceases the burner will extinguish and the diverter valve will remain in the domestic hot water mode, unless there is a demand for central heating.

3.3 Boiler Frost Protection Mode

1. The frost protection mode is integral to the appliance and functions as long as there is power to the boiler, as indicated by the standby signal ⏻.

2. With CH & DHW or CH only selected, when the boiler temperature falls below 5°C the boiler will fire until a temperature of 30°C is reached.

3. If DHW only is selected, when the boiler CH temperature falls below 5°C the boiler will fire until a temperature of 30°C is reached. When the boiler DHW temperature falls below 5°C the boiler will fire until a temperature of 7°C is reached.

4. Further protection can be incorporated by using a system frost thermostat.

3.4 Pump Protection

1. If the boiler has been inactive for a period of 24 hours the pump will automatically operate for 1 minute to prevent sticking.

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4.1

Appliance Type	C_{13}	C_{33}	C_{43}	C_{53}
Appliance Category	CAT I $_{2H\ 3P}$			
Heat Input CH (Net)		Max	Min	
24 model	kW	20	3.5	
28 model	kW	24	3.9	
33 model	kW	28	4.8	
40 model	kW	32	5.9	
Heat Output CH (Non-Condensing)				
		Max	Min	
24 model	kW	20	3.4	
28 model	kW	24	3.8	
33 model	kW	28	4.7	
40 model	kW	32	5.7	
Heat Output CH (Condensing)				
		Max	Min	
24 model	kW	21.2	3.7	
28 model	kW	25.3	4.1	
33 model	kW	29.6	5.1	
40 model	kW	33.8	6.2	
Heat Input DHW (Net)		Max		
24 model	kW	24.7		
28 model	kW	28.9		
33 model	kW	34		
40 model	kW	41.2		
Heat Output DHW		Max		
24 model	kW	24		
28 model	kW	28		
33 model	kW	33		
40 model	kW	40		
Injector				
24 model	mm	4.4		
28 model	mm	4.6		
33 model	mm	4.9		
40 model	mm	5.8		

NATURAL GAS ONLY !

Max Gas Rate	(Natural Gas - G20) (After 10 mins)	
24 model	m^3/h	2.54
28 model	m^3/h	2.96
33 model	m^3/h	3.49
40 model	m^3/h	4.23

Inlet Pressure (Natural Gas - G20)
mbar 20

PROPANE ONLY !

Max Gas Rate	(Propane - G31) (After 10 mins)	
24 model	kg/h	1.92
28 model	kg/h	2.25
33 model	kg/h	2.64
40 model	kg/h	3.2

Inlet Pressure (Propane - G31)
mbar 37

NOTE: All data in this section are nominal values and subject to normal production tolerances.

Electrical Supply 230V~ 50H_Z
(Appliance must be connected to an earthed supply)

Power Consumption

24 model	W	104
28 model	W	116
33 model	W	132
40 model	W	142

Electrical Protection IPX5D

External Fuse Rating 3A

Internal Fuse Rating F2L

Condensate Drain
To accept 21.5mm ($^3/_4$ in) plastic waste pipe

Flue Terminal Dimensions Diameter 100mm
Projection 125mm

Connections		copper tails
Gas Inlet	-	22mm
Heating Flow	-	22mm
Heating Return	-	22mm
Cold Water Inlet	-	15mm
Hot Water Outlet	-	15mm
Pressure Relief Discharge	-	15mm

Outercase Dimensions

Casing Height	- 763mm
Overall Height Inc Flue Elbow	- 923mm
Casing Width	- 450mm
Casing Depth	- 355mm

Clearances

Above Casing	175 mm Min
Below Casing	150 mm* Min
Front	450 mm Min (For Servicing)
Front	5 mm Min (In Operation)
L.H. Side	5 mm Min
R.H. Side	5 mm Min

*This is MINIMUM recommended dimension. Greater clearance will aid installation and maintenance.

Weights

	(24/28)
Packaged Boiler Carton	41.5kg
Installation Lift Weight	36kg
	(33)
Packaged Boiler Carton	43.5kg
Installation Lift Weight	38kg
	(40)
Packaged Boiler Carton	44.5kg
Installation Lift Weight	39kg

SEDBUK Declaration

SAP 2005 Seasonal Efficiency for N. G. models is 91.1%

SAP 2005 Seasonal Efficiency for L.P.G. models is 93.2%

SAP 2009 Annual Efficiency for N. G. models is 89%

SAP 2009 Annual Efficiency for L.P.G. models is 91%

This value is used in the UK Government's Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated has been certified by 0087.

NO_x Class 5

Central Heating Primary Circuit Pressures

	bar
Safety Discharge	3
Max Operating	2.5
Min Operating	0.5
Recommended Operating Range	1-2

DHW Circuit Pressures

	bar
Max Operating	8
Min Operating	0.15

Flow Rates	**(24)** l/min	**(28)** l/min	**(33)** l/min	**(40)** l/min
DHW Flow Rate @ 30°C Rise	10.9	12.9	15.3	18.3
DHW Flow Rate @ 35°C Rise	9.8	11.5	13.5	16.4
Min Working DHW Flow Rate	2	2	2	2

IMPORTANT: Where Low Flow Taps or Fittings are intended to be used in the DHW system connected it is strongly recommended that the DHW flow rate DOES NOT fall below 2.5l/min. This will ensure reliable operation of the DHW function.

Expansion Vessel - (For Central Heating only. Integral with appliance)

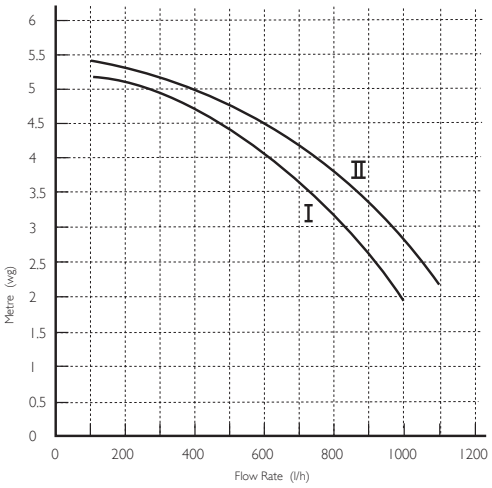
	bar	
Min Pre-charge Pressure	0.5	
	(24 & 28) litre	(33 & 40) litre
Max Capacity of CH System	125	155
Primary Water Content of Boiler (unpressurised)	2.5	2.8

Temperatures
C.H. Flow Temp (adjustable)
25°C to 80°C max (± 5°C)

D.H.W. Flow Temp (adjustable)
35°C to 60°C max (± 5°C)
dependent upon flow rate

Pump
Available Head See graph below

Pump - Available Head



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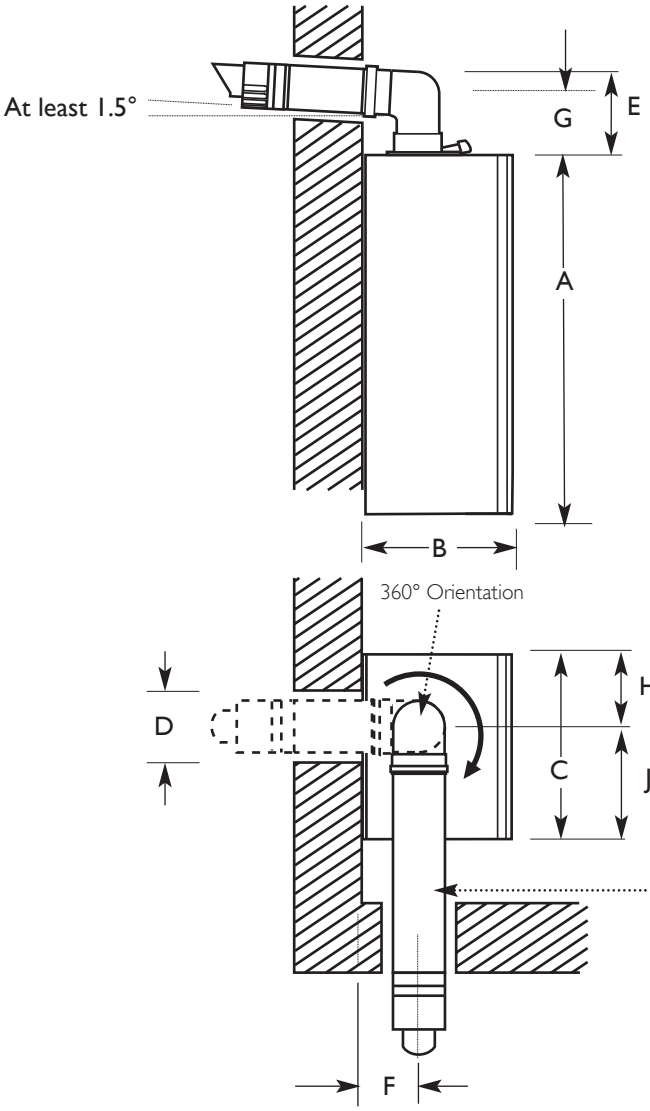


Dimensions

A 763mm

B 355mm*
*This can be reduced to 345mm by removing the boiler control access flap

C 450mm

D 116mm Ø Min.

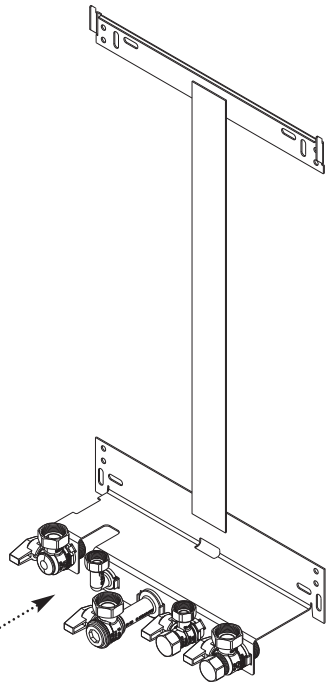
E 160mm
(207mm for 80/125mm flue systems)

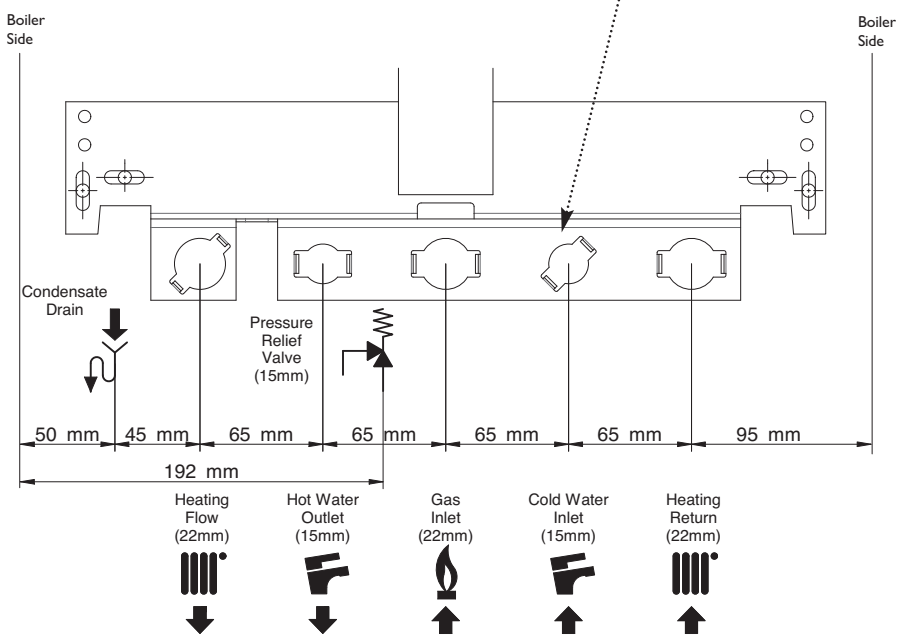
F 150mm

G 106mm

H 170mm

J 280mm





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6.0 System Details

6.1 Information

1. The Baxi Duo-tec Combi HE GA Condensing Combination Boiler is a 'Water Byelaws Scheme - Approved Product'. To comply with the Water Byelaws your attention is drawn to the following installation requirements and notes (IRN).

a) IRN 001 - See text of entry for installation requirements and notes.

b) IRN 302 - Byelaw 14.

2. Reference to the WRc publications, 'Water fittings and materials directory' and 'Water supply byelaws guide' give full details of byelaws and the IRNs.

6.2 Treatment of Water Circulating Systems

1. All recirculatory water systems will be subject to corrosion unless they are flushed and an appropriate water treatment is applied. To prevent this, follow the guidelines given in BS 7593 "Treatment of Water in Domestic Hot Water Central Heating Systems" and the treatment manufacturers instructions.

2. Treatment must involve the use of a proprietary cleanser, such as Sentinel X300 or X400, or Fernox F3 and an inhibitor such as Sentinel X100 or Fernox MB-1.

3. Full instructions are supplied with the products, for further information contact Sentinel (0800 389 4670) or Fernox (0870 870 0362).

Failure to flush and add inhibitor to the system will invalidate the appliance warranty.

4. It is important to check the inhibitor concentration after installation, system modification and at every service in accordance with the inhibitor manufacturer's instructions. (Test kits are available from inhibitor stockists.)

5. For information or advice regarding any of the above contact Technical Enquiries 0844 871 1555.

6.3 Bypass

1. The boiler is fitted with an automatic integral bypass. Some systems may require an additional external bypass.

6.4 System Control

1. Further external controls (e.g. room thermostat sensors) MUST be fitted to optimise the economical operation of the boiler in accordance with Part L of the Building Regulations (2010). A range of optional controls is available. Full details are contained in the relevant Sales Literature.

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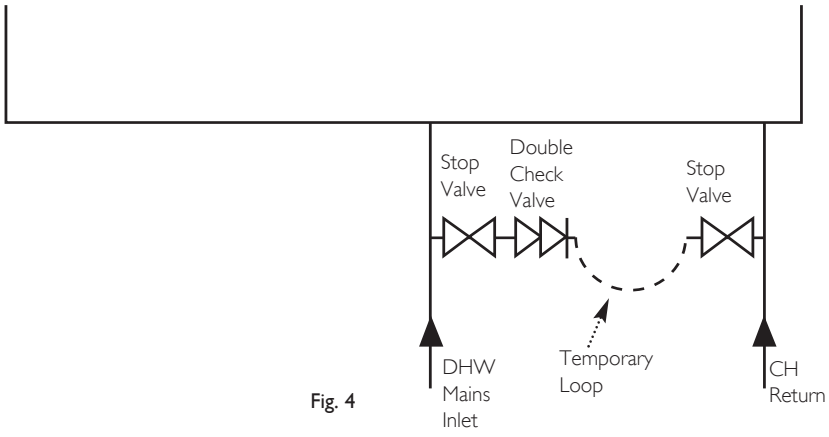


Fig. 4

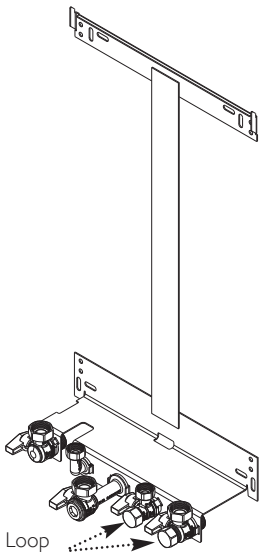
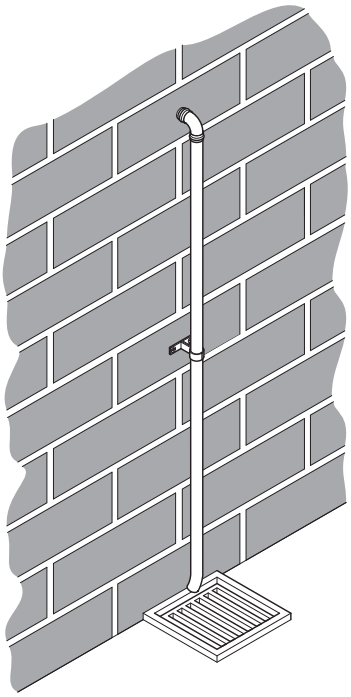
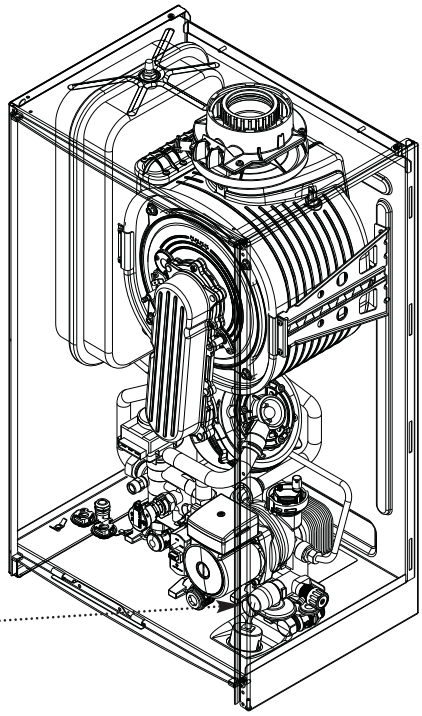


Fig. 5



The end of the pipe should terminate facing down and towards the wall

Fig. 6a



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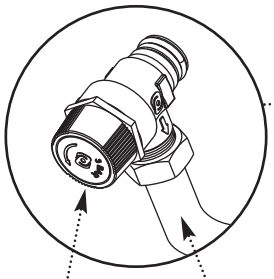

Fig. 6

6.5 System Filling and Pressurising

1. A filling point connection on the central heating return pipework must be provided to facilitate initial filling and pressurising and also any subsequent water loss replacement/refilling.

2. A filling loop is supplied with the boiler. Follow the instructions provided with it.

3. The filling method adopted must be in accordance with all relevant water supply regulations and use approved equipment.

4. Your attention is drawn to:
for GB: Guidance G24.2 and recommendation R24.2 of the Water Regulations Guide.
for IE: the current edition of I.S. 813 "Domestic Gas Installations".

5. The sealed primary circuits may be filled or replenished by means of a temporary connection between the circuit and a supply pipe, provided a 'Listed' double check valve or some other no less effective backflow prevention device is permanently connected at the inlet to the circuit and the temporary connection is removed after use.

6.6 Expansion Vessel (Central Heating only)

1. The appliance expansion vessel is pre-charged to 0.5 bar. Therefore, the minimum cold fill pressure is 0.5 bar. The vessel is suitable for correct operation for system capacities up to 125 litres (24/28) or 155 litres (33/40). For greater system capacities an additional expansion vessel must be fitted. For GB refer to BS 7074 Pt 1. For IE, the current edition of I.S. 813 "Domestic Gas Installations".

6.7 Safety Pressure Relief Valve (Fig. 6)

1. The pressure relief valve is set at 3 bar, therefore all pipework, fittings, etc. should be suitable for pressures in excess of 3 bar and temperature in excess of 100°C.

2. The pressure relief discharge pipe should be not less than 15mm dia, run continuously downward, and discharge outside the building, preferably over a drain. It should be routed in such a manner that no hazard occurs to occupants or causes damage to wiring or electrical components. The end of the pipe should terminate facing down and towards the wall (Fig. 6a).

3. The discharge must not be above a window, entrance or other public access. Consideration must be given to the possibility that boiling water/steam could discharge from the pipe.

4. A remote relief valve kit is available to enable the boiler to be installed in cellars or similar locations below outside ground level (kit no. 5121379).

5. A boiler discharge pump is available, part no. 720648301. This pump will dispose of both condensate & high temperature water from the relief valve. It has a maximum head of 5 metres.

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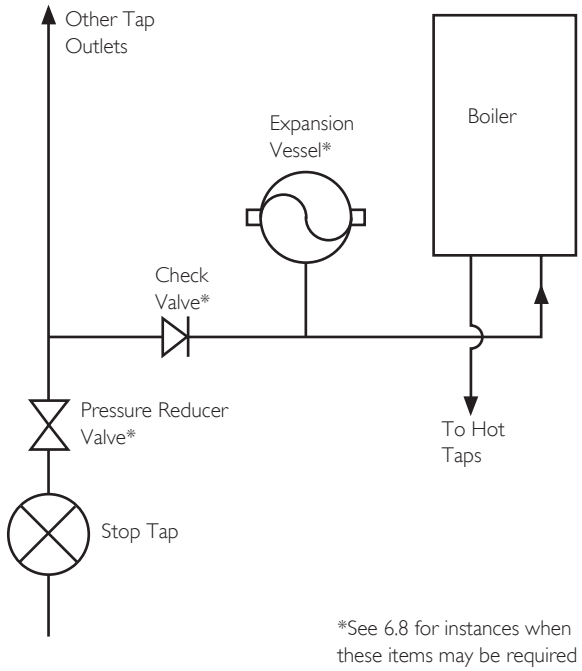

Fig. 7

IMPORTANT: Where Low Flow Taps or Fittings are intended to be used in the DHW system connected to a Baxi Duo-tec Combi GA it is strongly recommended that the DHW flow rate DOES NOT fall below 2.5l/min. This will ensure reliable operation of the DHW function.

6.8 Domestic Hot Water Circuit (Fig. 7)

1. All DHW circuits, connections, fittings, etc. should be fully in accordance with relevant standards and water supply regulations.

2. Your attention is drawn to:
for GB: Guidance G17 to G24 and recommendation R17 to R24 of the Water Regulations Guide.
for IE: the current edition of I.S. 813 "Domestic Gas Installations".

3. The Water Regulations recommendations for England and Wales prohibits backflow from appliances into the wholesome water supply due to thermal expansion. However this type of instantaneous combination boiler, with less than 15 litres of stored capacity, does not require any backflow prevention device as any thermal expansion is accommodated within the appliance.
It is possible in certain circumstances that other cold water demands (e.g. washing machines, flushing of W.C.s) may affect the DHW function of the boiler. In these instances the fitting of a backflow prevention device and expansion vessel is recommended.

4. Also if there is an existing check valve, loose jumpered stop cock, water meter or water treatment device already fitted to the wholesome water supply connected to the boiler domestic hot water (DHW) inlet supply then a suitable expansion device may be required.

5. The boiler's maximum working mains pressure is 8 bar, therefore all pipework, connections, fittings, etc. should be suitable for pressures in excess of 8 bar. A pressure reducing valve must be fitted for pressures in excess of 8 bar. The manufacturer of any outlet fittings, such as a shower valve, may require a lower maximum pressure. The pressure reduction must take account of all fittings connected to the DHW system.

6.9 Showers

1. If a shower control is supplied from the appliance it should be of the thermostatic or pressure balanced type. Thermostatic type shower valves provide the best comfort and guard against water at too high a temperature. Existing controls may not be suitable - refer to the shower valve manufacturer.

6.10 Hard Water Areas

1. If the area of the installation is recognised as a HARD WATER AREA then a suitable device should be fitted to treat the mains water supply to the boiler. Contact your Water Distribution Company for advice on suitable devices.

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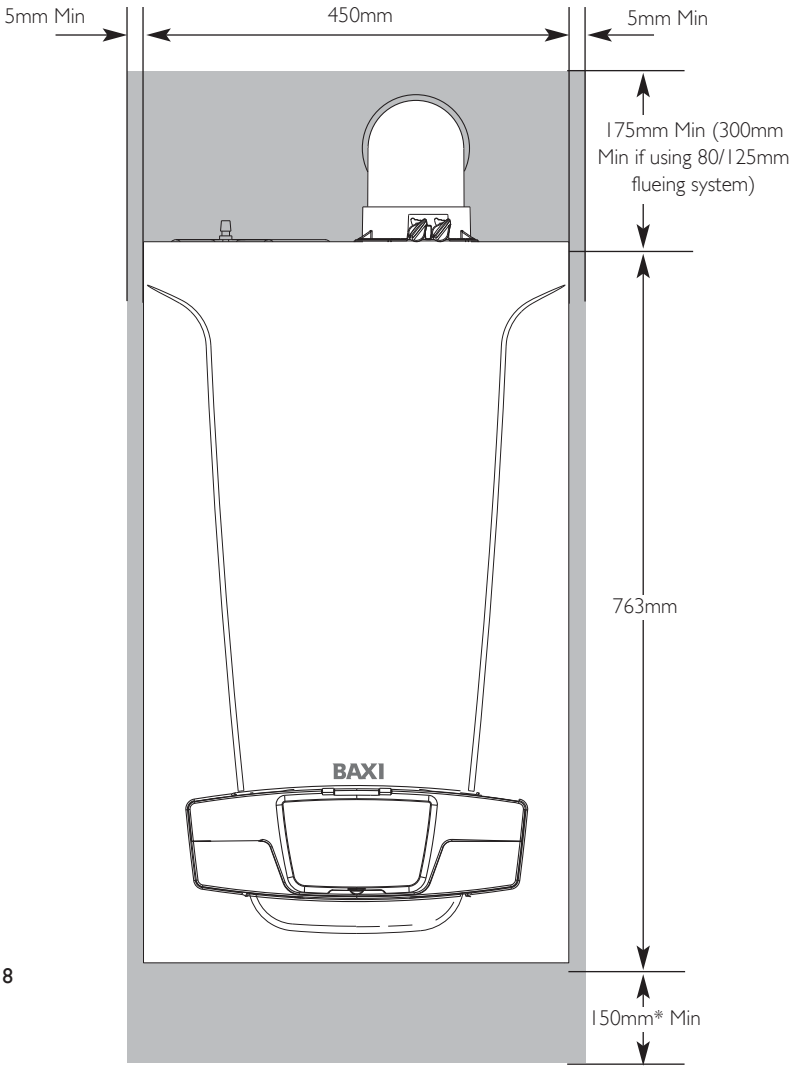

Fig. 8

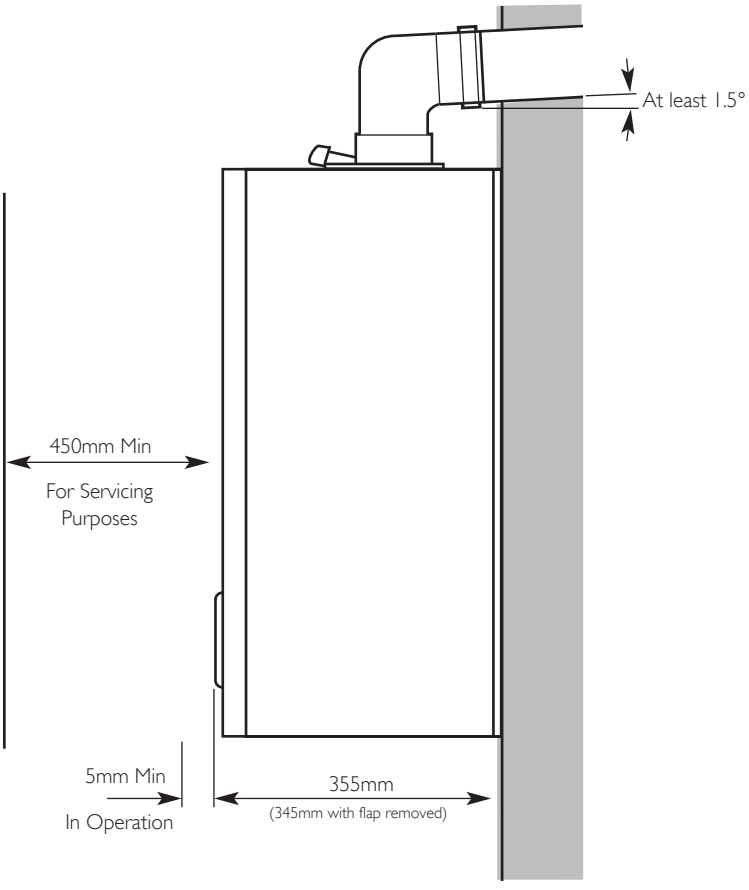

Fig. 9

7.0 Site Requirements

7.1 Location

1. The boiler may be fitted to any suitable wall with the flue passing through an outside wall or roof and discharging to atmosphere in a position permitting satisfactory removal of combustion products and providing an adequate air supply. The boiler should be fitted within the building unless otherwise protected by a suitable enclosure i.e. garage or outhouse. (The boiler may be fitted inside a cupboard-see Section 7.3).

2. Where the boiler is sited in an unheated enclosure and during periods when the heating system is to be unused it is recommended that the permanent live is left on to give BOILER frost protection. NOTE: THIS WILL NOT PROTECT THE SYSTEM!

3. If the boiler is fitted in a room containing a bath or shower reference must be made to the relevant requirements.
In GB this is the current I.E.E. Wiring Regulations and Building Regulations.
In IE reference should be made to the current edition of I.S. 813 "Domestic Gas Installations" and the current ETCI rules.

4. If the boiler is to be fitted into a building of timber frame construction then reference must be made to the current edition of Institute of Gas Engineers Publication IGE/UP/7 (Gas Installations in Timber Framed Housing).

7.2 Clearances (Figs. 8 & 9)

1. A flat vertical area is required for the installation of the boiler.

2. These dimensions include the necessary clearances around the boiler for case removal, spanner access and air movement. Additional clearances may be required for the passage of pipes around local obstructions such as joists running parallel to the front face of the boiler.

*This is MINIMUM recommended dimension. Greater clearance will aid installation and maintenance.

7.3 Ventilation of Compartments

1. Where the appliance is installed in a cupboard or compartment, no air vents are required.

2. BS 5440: Part 2 refers to room sealed appliances installed in compartments. The appliance will run sufficiently cool without ventilation.

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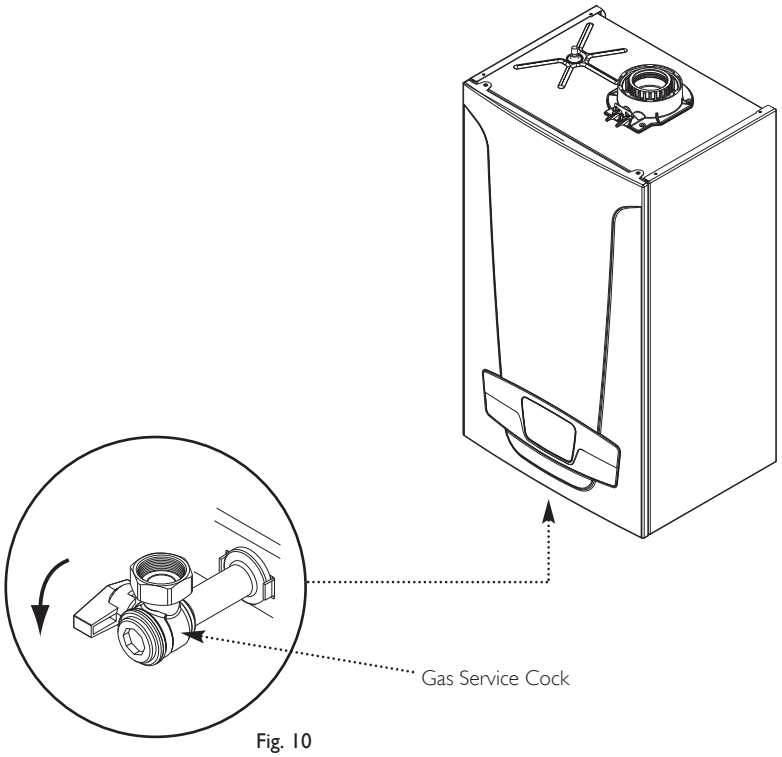

Fig. 10

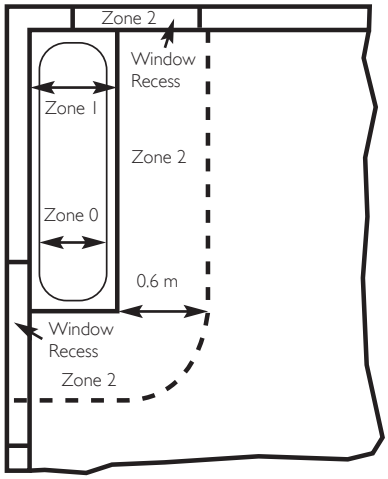

Fig. A In GB Only

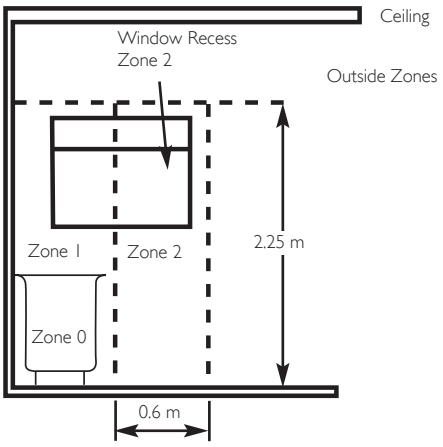

Fig. B In GB Only

7.0 Site Requirement

7.4 Gas Supply

1. The gas installation should be in accordance with the relevant standards. In GB this is BS 6891 (NG) or BS 5482 Pt. 1 (LPG). In IE this is the current edition of I.S. 813 "Domestic Gas Installations".

2. The connection to the appliance is a 22mm copper tail located at the rear of the gas service cock (Fig. 10).

3. Ensure that the pipework from the meter to the appliance is of adequate size, and the demands of any other gas appliances in the property are taken into consideration. Do not use pipes of a smaller diameter than the boiler gas connection (22mm).

7.5 Electrical Supply

1. External wiring must be correctly earthed, polarised and in accordance with relevant regulations/rules. In GB this is the current I.E.E. Wiring Regulations. In IE reference should be made to the current edition of ETCI rules.

2. The mains supply is 230V ~ 50H_Z fused at 3A.

NOTE: The method of connection to the electricity supply must facilitate complete electrical isolation of the appliance.

Connection may be via a fused double-pole isolator with a contact separation of at least 3mm in all poles and servicing the boiler and system controls only.

7.6 Bath & Shower Rooms

1. If the boiler is fitted in a room containing a bath or shower it can be fitted in zone 2, (Figs. A & B shows zone dimensions for a bathtub. For other examples refer to the Current I.E.E. Wiring Regulations) reference must be made to the relevant requirements.
In GB this is the current I.E.E. Wiring Regulations and Building Regulations.
In IE reference should be made to the current edition of I.S. 813 "Domestic Gas Installations" and the current ETCI rules.

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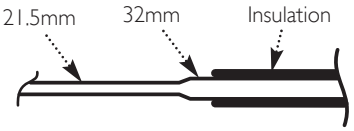
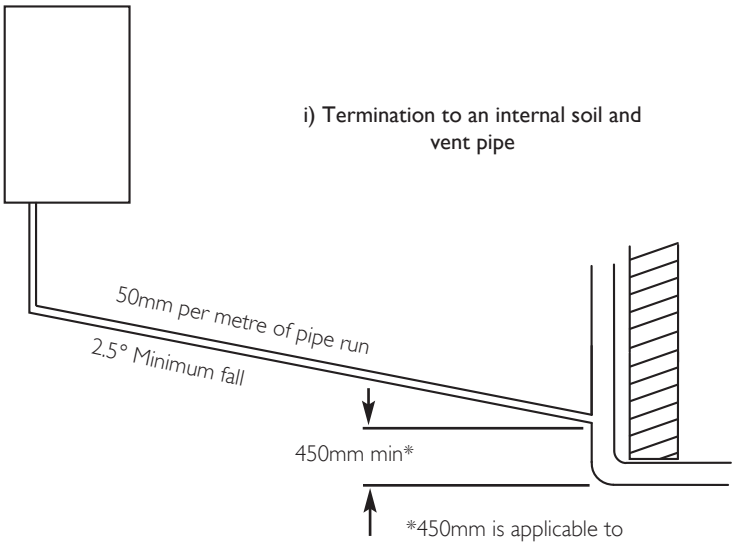
Examples are shown of the following methods of termination:-
i) to an internal soil & vent pipe
ii) via an internal discharge branch (e.g. sink waste) downstream of the trap
iii) to a drain or gully
iv) to a purpose made soakaway
v) pumped into an internal discharge branch (e.g. sink waste) downstream of the trap
vi) pumped into an external soil & vent pipe
vii) to a drain or gully with extended external run & trace heating

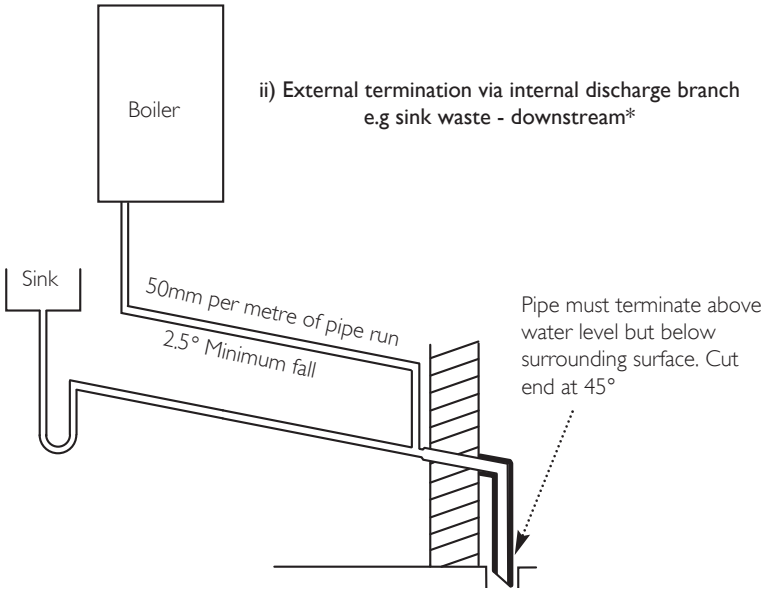
It is strongly recommended to discharge internally into the household drainage system. If connecting to a rain water drain, that drain MUST discharge into a foul drain.





i) Termination to an internal soil and vent pipe

*450mm is applicable to properties up to 3 storeys. For multi-storey building installations consult BS 6798.


Boiler
Sink
50mm per metre of pipe run
2.5° Minimum fall
Pipe must terminate above water level but below surrounding surface. Cut end at 45°

ii) External termination via internal discharge branch e.g sink waste - downstream*

*It is NOT RECOMMENDED to connect upstream of the sink or other waste water receptacle !

7.0 Site Requirements

7.7 Condensate Drain

FAILURE TO INSTALL THE CONDENSATE DISCHARGE PIPEWORK CORRECTLY WILL AFFECT THE RELIABLE OPERATION OF THE BOILER.

CAREFUL CONSIDERATION MUST BE GIVEN TO THE POSSIBILITY OF THE PIPEWORK BEING SUBJECT TO FREEZING CONDITIONS AND APPROPRIATE MEASURES TAKEN TO PREVENT BLOCKAGE. CORRECT INSTALLATION IN ACCORDANCE WITH THIS SECTION WILL CONSIDERABLY MINIMISE THE LIKELIHOOD OF BLOCKAGE AND SUBSEQUENT BOILER LOCK-OUT.

A CONDENSATE DISCHARGE PUMP AND PIPE 'TRACE HEATING' ARE AVAILABLE AS ACCESSORIES - see paragraphs 7.7.12 to 7.715 for further details.

The condensate discharge pipe MUST NOT RISE at any point along its length. There MUST be a fall of AT LEAST 2.5° (50mm per metre) along the entire run EXCEPT when employing a suitable condensate pump in basement and cellar or similar applications.

The boiler condensate trap incorporates a seal of 75mm, therefore it is unnecessary to install an air break and trap in the discharge pipework.

1. The condensate outlet will accept 21.5mm (3/4in) plastic overflow pipe. **It is strongly recommended that this discharges internally into the household drainage system**. Where this is not possible, discharge into an outside drain is permissible providing every possible precaution is taken to prevent freezing.

2. Ensure the discharge of condensate complies with any national or local regulations in force. **BS 6798 & Part H1 of the Building Regulations give further detailed guidance.**

3. The discharge pipe should be run in a proprietary drain pipe material e.g. PVC, PVC-U, ABS, PVC-C or PP.

4. Metal pipework is NOT suitable for use in condensate discharge systems.

5. The pipe should be a minimum of 21.5mm diameter and must be supported using suitably spaced clips of the correct design to prevent sagging.

6. **It is advisable that the full length of condensate pipe is run internally and preferably be less than 3 metres.**

7. **Internal runs greater than 3 metres or runs in cold areas should use 32mm waste pipe.**

8. **External runs MUST be a MINIMUM of 32mm and fully insulated with material suitable for external use.**

9. If the boiler is fitted in an unheated location the entire condensate discharge pipe should be treated as an external run and sized and insulated accordingly.

10. In all cases discharge pipe must be installed to aid disposal of the condensate. To reduce the risk of condensate being trapped, as few bends and fittings as possible should be used and any burrs on cut pipe removed.

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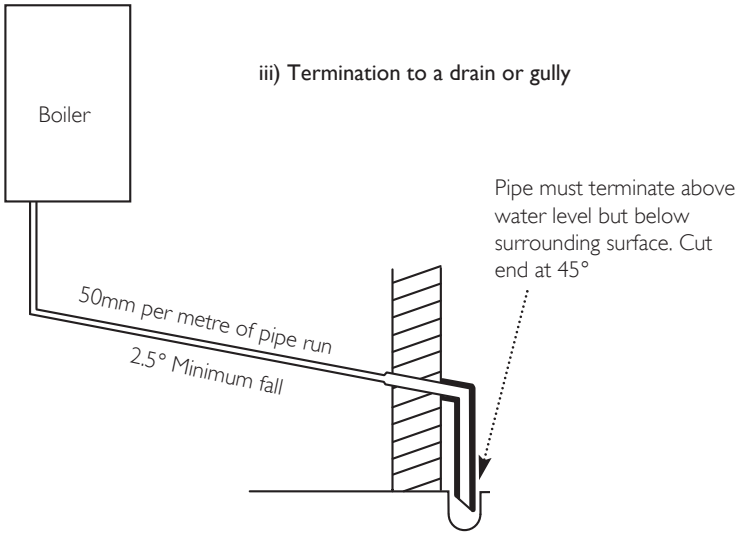
7.7 Condensate Drain (cont.)

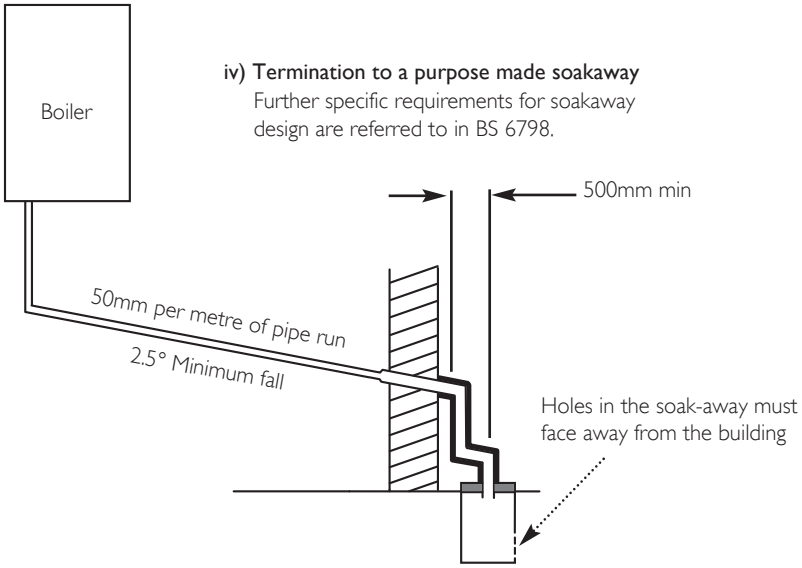
11. When discharging condensate into a soil stack or waste pipe the effects of existing plumbing must be considered. If soil pipes or waste pipes are subjected to internal pressure fluctuations when WC's are flushed or sinks emptied then back-pressure may force water out of the boiler trap and cause appliance lockout.

iii) Termination to a drain or gully


Boiler
Pipe must terminate above water level but below surrounding surface. Cut end at 45°
50mm per metre of pipe run
2.5° Minimum fall

iv) Termination to a purpose made soakaway

Further specific requirements for soakaway design are referred to in BS 6798.



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7.7 Condensate Drain (cont.)

12. A boiler discharge pump is available, 'MULTIFIT' part no. 720648301. This pump will dispose of both condensate & high temperature water from the relief valve. It has a maximum head of 5 metres. Follow the instructions supplied with the pump.

13. Condensate Drain Pipe 'Trace Heating' Elements are available in various lengths. 'MULTIFIT' part nos.:-

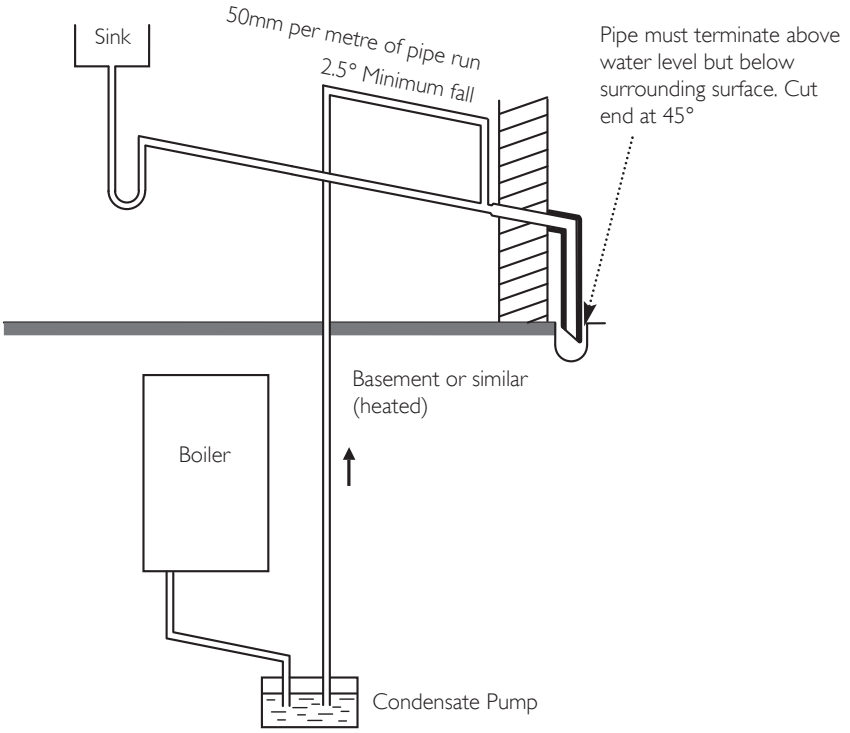
1 metre 720644401
2 metre 720664101
3 metre 720664201
5 metre 720664401*

*Where the drain is between 3 & 5 metres a 5 metre kit can be used and "doubled back" upon itself.

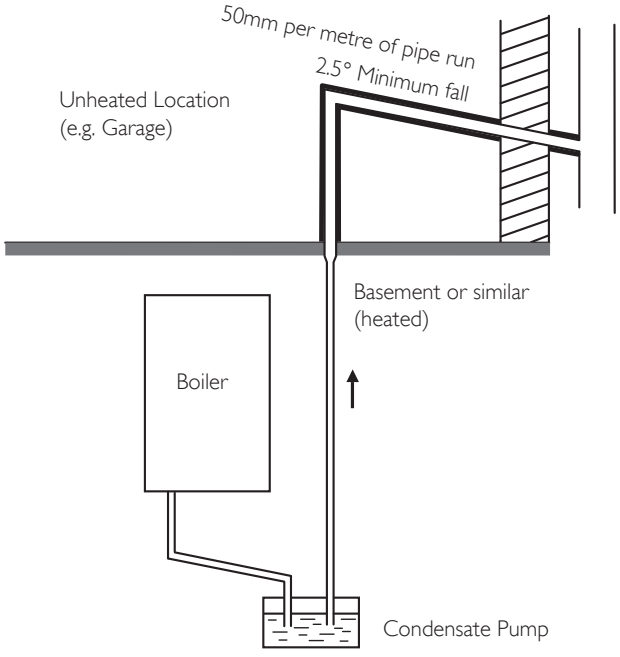
14. It is possible to fit the element externally on the condensate drain or internally as detailed in the instructions provided.

15. The fitting of a 'Trace Heating' Element is NOT a substitute for correct installation of the condensate drain. ALL requirements in this section must still be adhered to.

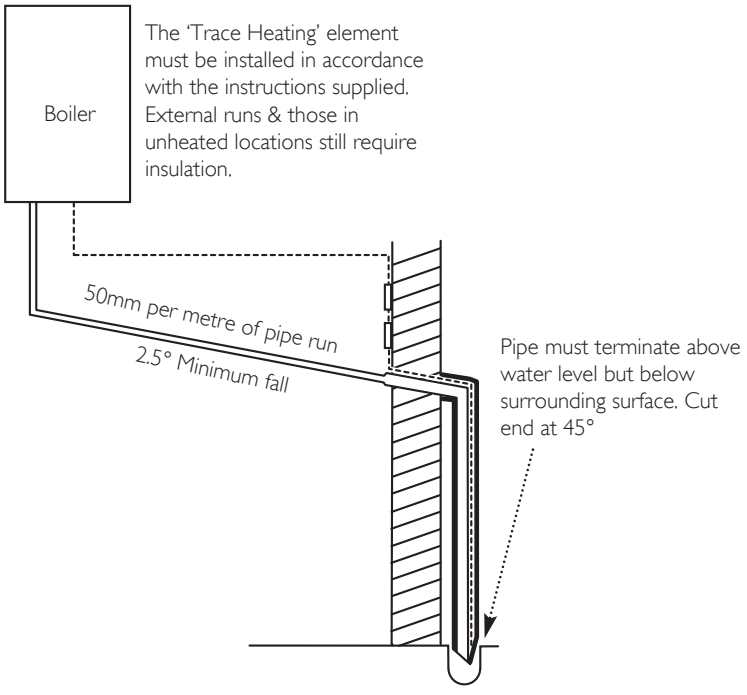
v) pumped into an internal discharge branch (e.g. sink waste) downstream of the trap


Sink
50mm per metre of pipe run
2.5° Minimum fall
Pipe must terminate above water level but below surrounding surface. Cut end at 45°
Basement or similar (heated)
Boiler
Condensate Pump

vi) pumped into an external soil & vent pipe



vii) to a drain or gully with extended external run & trace heating


Boiler
The 'Trace Heating' element must be installed in accordance with the instructions supplied. External runs & those in unheated locations still require insulation.
50mm per metre of pipe run
2.5° Minimum fall
Pipe must terminate above water level but below surrounding surface. Cut end at 45°

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Terminal Position with Minimum Distance (Fig. 12)		(mm)
A[1]	Directly below an opening, air brick, opening windows, etc.	300
B[1]	Above an opening, air brick, opening window etc.	300
C[1]	Horizontally to an opening, air brick, opening window etc.	300
D[2]	Below gutters, soil pipes or drain pipes.	25 (75)
E[2]	Below eaves.	25 (200)
F[2]	Below balconies or car port roof.	25 (200)
G[2]	From a vertical drain pipe or soil pipe.	25 (150)
H[2]	From an internal or external corner.	25 (300)
I	Above ground, roof or balcony level.	300
J	From a surface or boundary line facing a terminal.	600
K	From a terminal facing a terminal (Horizontal flue).	1200
	From a terminal facing a terminal (Vertical flue).	600
L	From an opening in carport (e.g. door, window) into the dwelling.	1200
M	Vertically from a terminal on the same wall.	1500
N	Horizontally from a terminal on the same wall.	300
R	From adjacent wall to flue (vertical only).	300
S	From an adjacent opening window (vertical only).	1000
T	Adjacent to windows or openings on pitched and flat roofs	600
U	Below windows or openings on pitched roofs	2000

1 In addition, the terminal should be no nearer than 150 mm to an opening in the building fabric formed for the purpose of accommodating a built-in element such as a window frame.

2 Only **ONE** 25mm clearance is allowed per installation. If one of the dimensions D, E, F, G or H is 25mm then the remainder **MUST** be as shown in brackets, in accordance with B.S.5440-1.

NOTE: The distance from a fanned draught appliance terminal installed parallel to a boundary may not be less than 300mm in accordance with the diagram below

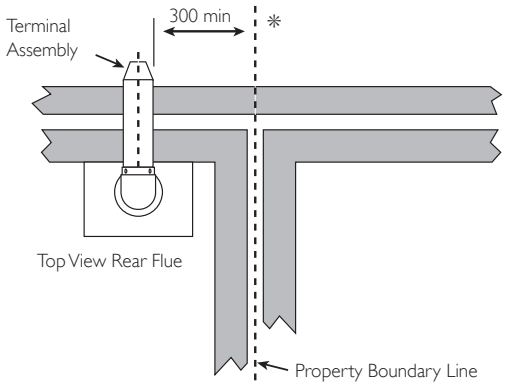
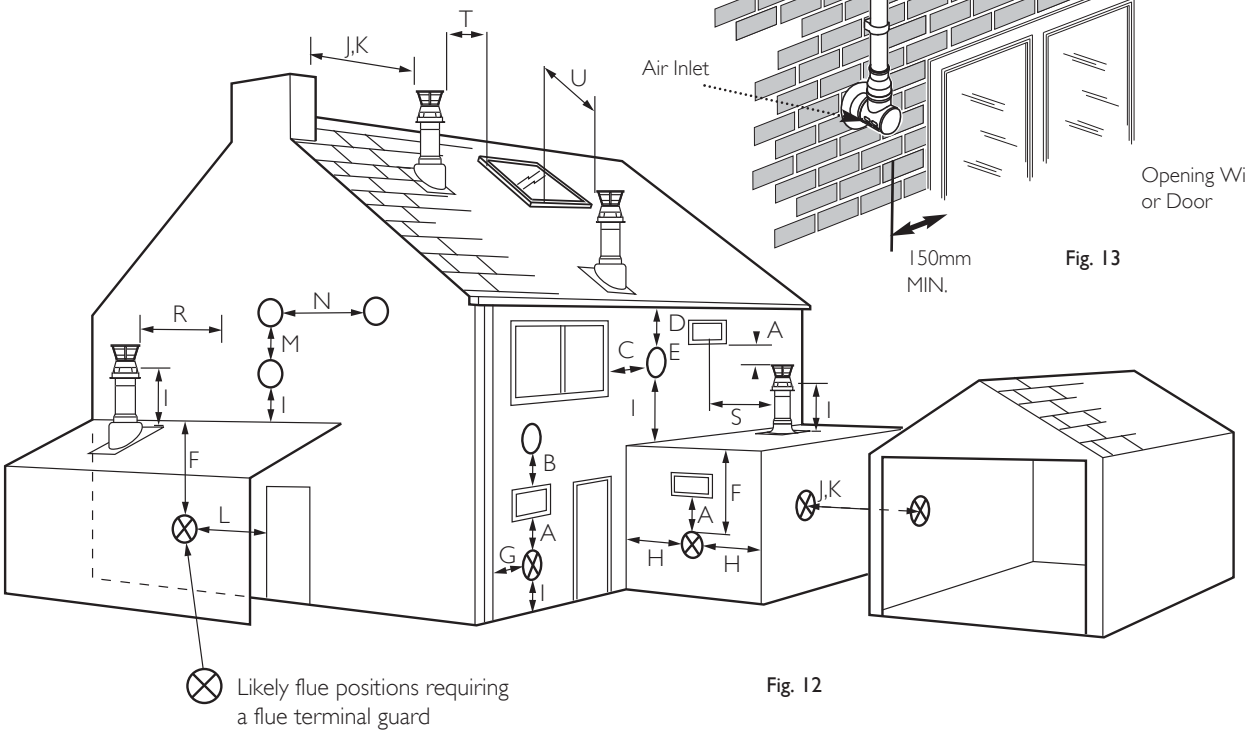


Fig. 11



Likely flue positions requiring a flue terminal guard

Fig. 12

7.0 Site Requirements

7.8 Flue

NOTE: Due to the nature of the boiler a plume of water vapour will be discharged from the flue. This should be taken into account when siting the flue terminal.

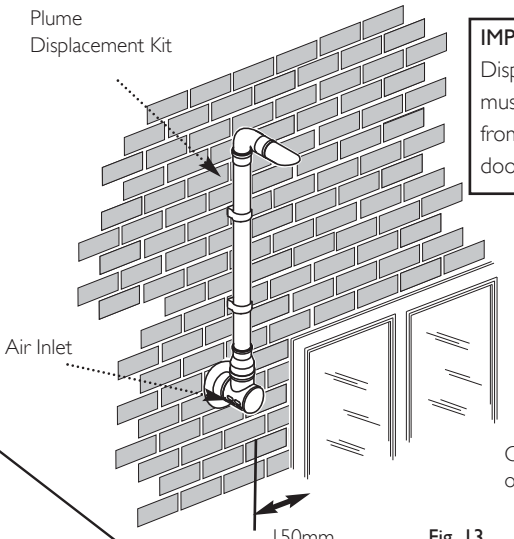
1. The following guidelines indicate the general requirements for siting balanced flue terminals. For GB recommendations are given in BS 5440 Pt 1. For IE recommendations are given in the current edition of I.S. 813 "Domestic Gas Installations".

2. If the terminal discharges onto a pathway or passageway, check that combustion products will not cause a nuisance and that the terminal will not obstruct the passageway.

3. **If a terminal is less than 2 metres above a balcony, above ground or above a flat roof to which people have access, then a suitable terminal guard must be provided.**

IMPORTANT:
- Under car ports we recommend the use of the plume displacement kit.
- The terminal position must ensure the safe and nuisance - free dispersal of combustion products.

*4. Reduction to the boundary is possible down to 25mm but flue deflector part no. 5111068 must be used.



IMPORTANT: If fitting a Plume Displacement Flue Kit, the air inlet must be a minimum of 150mm from any opening windows or doors (see Fig. 13).

Fig. 13

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8.0 Flue Options

8.1 Horizontal Flue Systems

1. The standard flue is suitable only for horizontal termination applications.

2. All fittings should be fully engaged. The approximate engagement is 40mm. Apply the lubricant supplied to the seal on each fitting to aid assembly.

3. Maximum permissible equivalent flue lengths are:-

	(60/100)	(80/125)
Horizontal Concentric	10 metres	20 metres

4. Any additional "in line" bends in the flue system must be taken into consideration.
Their equivalent lengths are:-
Concentric Pipes:

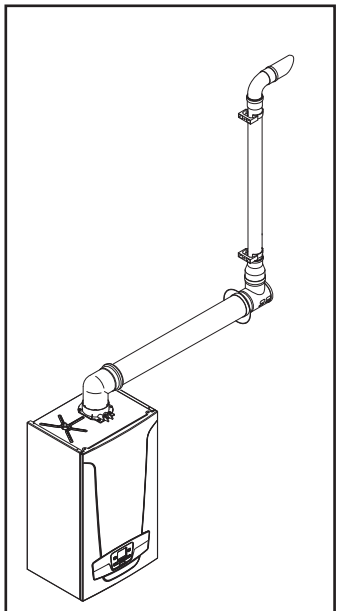
135° bend	0.5 metres
93° bend	1.0 metres

5. The elbow supplied with the standard horizontal telescopic flue kit is not included in any equivalent length calculations.

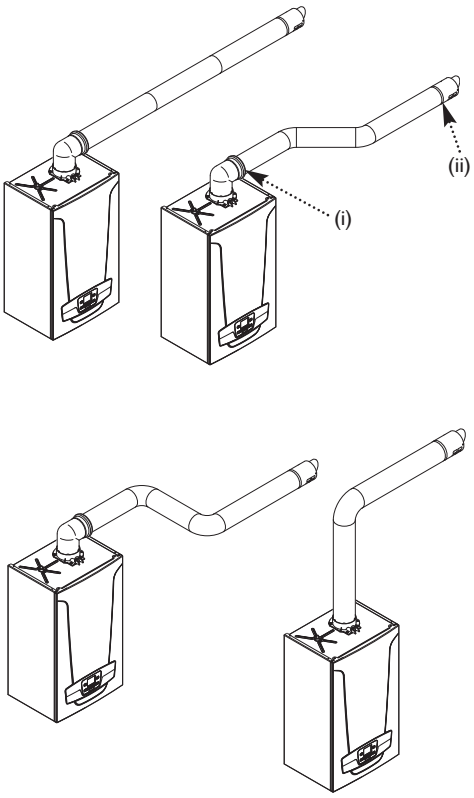
NOTE: Flue length is measured from point (i) to (ii) as shown.

IMPORTANT
SUPPORT - All flue systems MUST be securely supported a MINIMUM of once every metre. It is recommended that every straight piece is supported irrespective of length. Additional supports are available as accessories.
VOIDS - Consideration must be given to flue systems in voids and the provision of adequate access for subsequent periodic visual inspection.

6. Read this section in conjunction with the Flue Installation Guide supplied with the boiler.

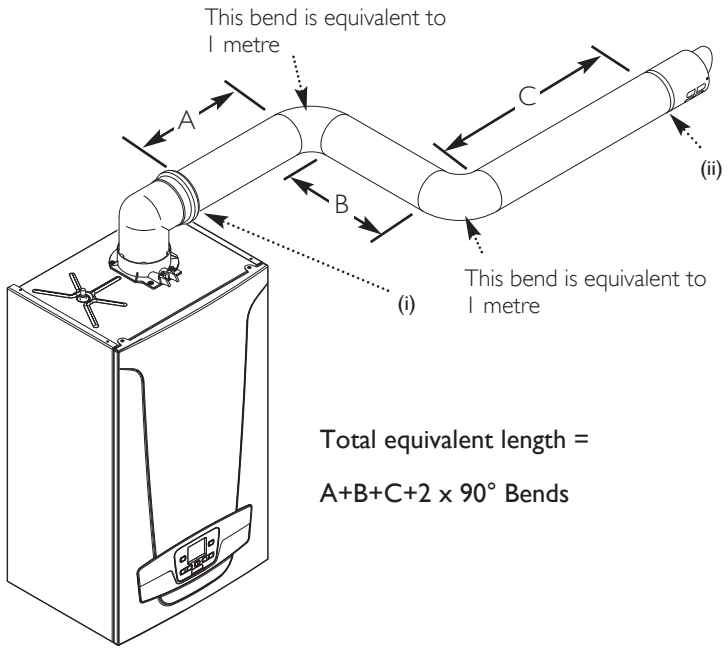


Plume Displacement Kit 60 /100 dia 1M Extensions 45° & 93° elbows are also available - see the separate Flue Guide.



Horizontal Flues

NOTE: Horizontal flue pipes should always be installed with a fall of at least 1.5° from the terminal to allow condensate to run back to the boiler.



Total equivalent length =

A+B+C+2 x 90° Bends

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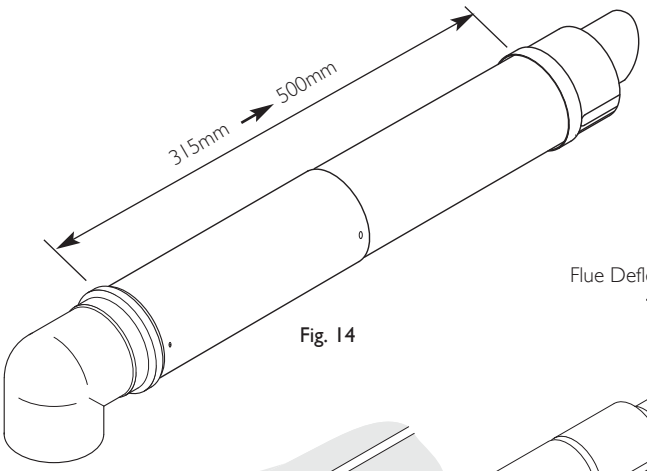

Fig. 14

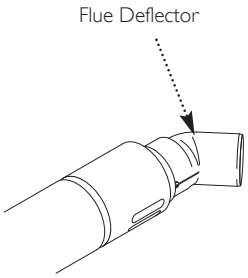

Fig. 16

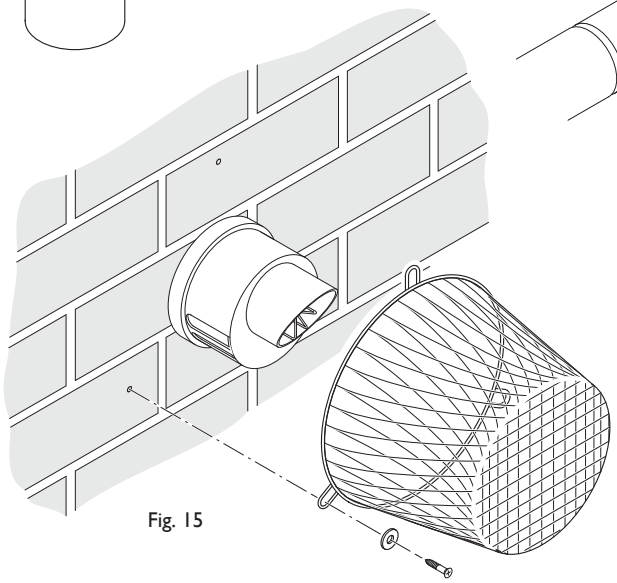

Fig. 15

8.0 Flue Options

8.2 Flue Lengths

The standard horizontal telescopic flue kit allows for lengths between 315mm and 500mm from elbow to terminal without the need for cutting (Fig. 14).
Extensions of 250mm, 500mm & 1m are available.

The maximum permissible equivalent flue length is:

10 metres (60/100 system - vertical & horizontal)
20 metres (80/125 system - vertical & horizontal)
15 metres (80/80 twin pipe)
8 metres (60/100 system - vertical connected to ridge terminal)

8.3 Flue Trim

1. The flexible flue trims supplied can be fitted on the outer and inner faces of the wall of installation.

8.4 Terminal Guard (Fig. 15)

1. When codes of practice dictate the use of terminal guards 'Multifit' accessory part no. 720627901 can be used (Note: This is not compatible with Flue Deflector referred to below).

2. There must be a clearance of at least 50mm between any part of the terminal and the guard.

3. When ordering a terminal guard, quote the appliance name and model number.

4. The flue terminal guard should be positioned centrally over the terminal and fixed as illustrated.

8.5 Flue Deflector (Fig. 16)

1. If required, push the flue deflector over the terminal end and rotate to the optimum angle for deflecting plume. Secure the deflector to the terminal with screws provided.

8.6 Flue Accessories

1. For full details of Flue Accessories (elbows, extensions, clamps etc.) refer to the Flue Installation Guide supplied in the literature pack.

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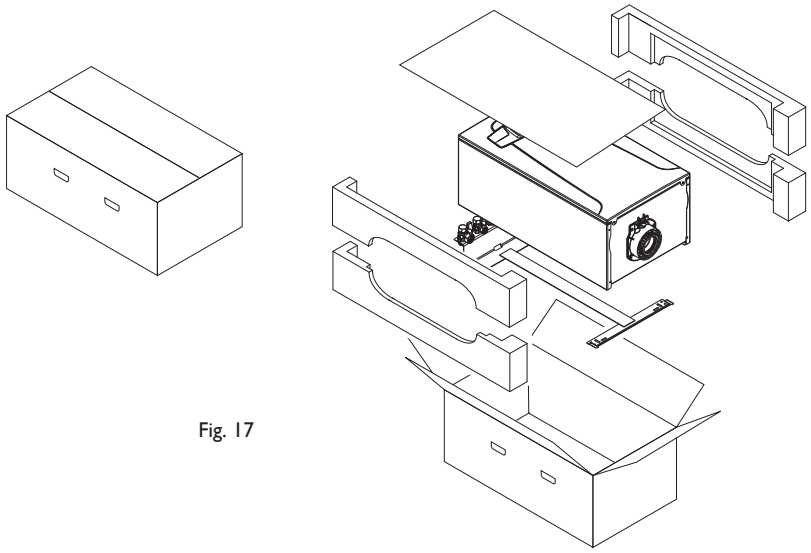
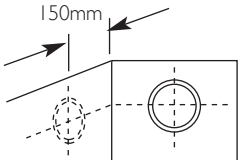
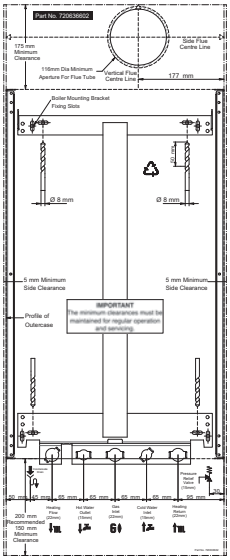


Fig. 17



For Side Flue Exit

Fig. 18



Wall Template

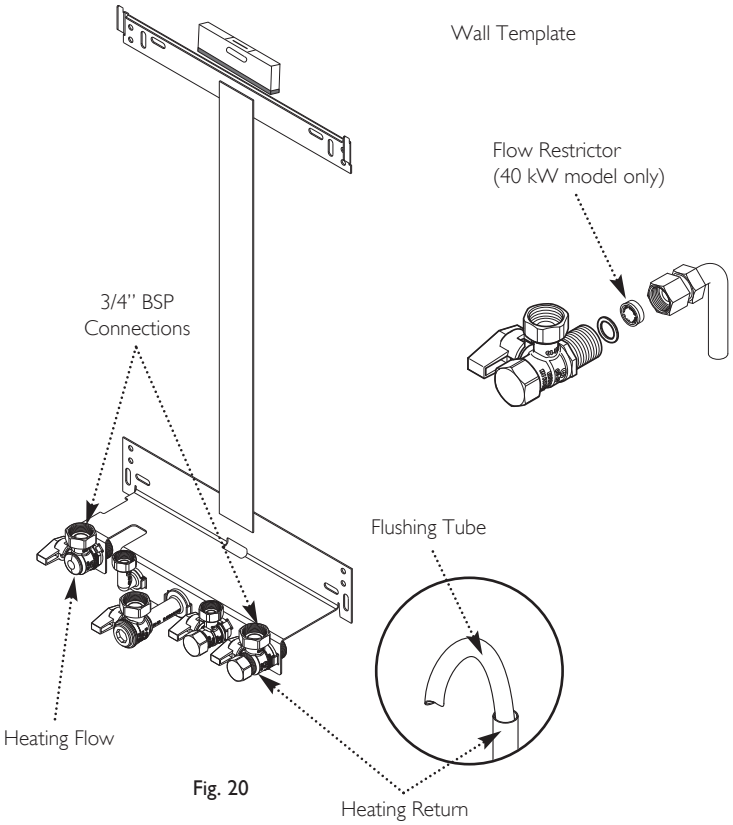


Fig. 20

9.0 Installation

9.1 Unpacking & Initial Preparation

IMPORTANT
RISK ASSESSMENT - Before commencing the installation it is recommended that the 'Five Steps to Risk Assessment' document published by the HSE is consulted, and an assessment performed as described. GAS SUPPLY - The gas supply, gas type and pressure must be checked for suitability before connection (see Section 7.4).

NOTE: A small amount of water may drain from the boiler in the upright position. If pre-plumbing it will be necessary to turn the carton over to access the wall plate first.

1. Remove staples, open flaps and remove the cardboard sheet. Remove the polystyrene side pieces and literature. Two people can then lift out the boiler (Fig. 17).

2. After considering the site requirements (see Section 7.0) position the fixing template on the wall ensuring it is level both horizontally and vertically.

3. Mark the position of the two most suitable fixing slots for the wall plate and boiler lower fixing holes.

4. Mark the position of the centre of the flue hole (rear exit). For side flue exit, mark as shown (Fig. 18).

5. If required, mark the position of the gas and water pipes. Remove the template.

6. Cut the hole for the flue (minimum diameter 116mm).

7. Drill the wall as previously marked to accept the wall plugs supplied. Secure the wall plate using the fixing screws.

8. Using a spirit level ensure that the plate is level before finally tightening the screws.

9. Connect the gas and water pipes to the valves on the wall plate using the copper tails supplied. Ensure that the sealing washers are fitted between the connections.

NOTE: 40kW models ONLY - ensure the flow restrictor is inserted in cold water inlet connection (Fig. 19). On other models the restrictor is factory fitted internally.

10. Fit the filling loop as described in the instructions supplied with it.

9.2 Flushing

1. Connect a tube to the heating flow or return pipe (Fig. 20).

2. Flush thoroughly (see System Details, Section 6.2).

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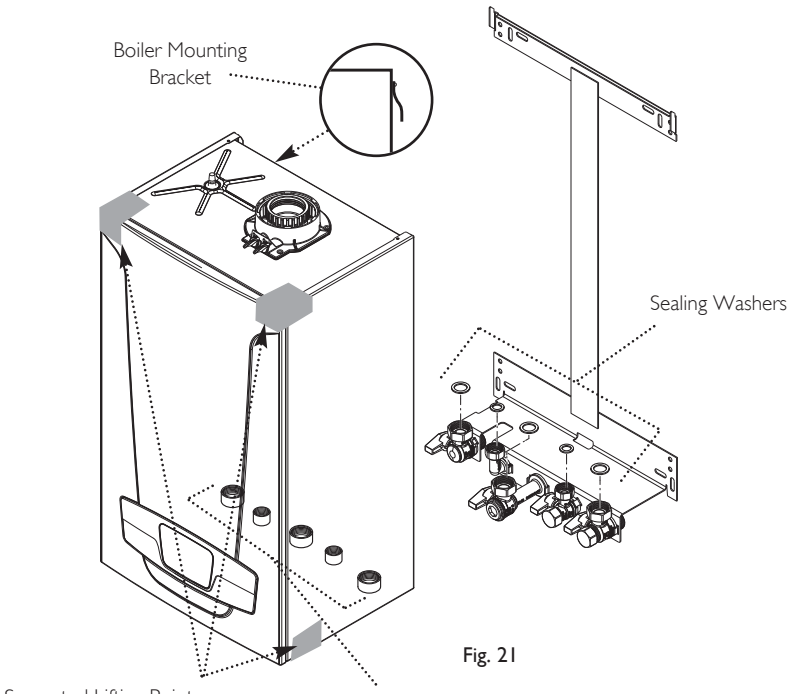
Boiler Mounting Bracket
Sealing Washers
Suggested Lifting Points shown as shaded area
Remove Sealing Caps from under the Boiler before lifting into position

Fig. 21

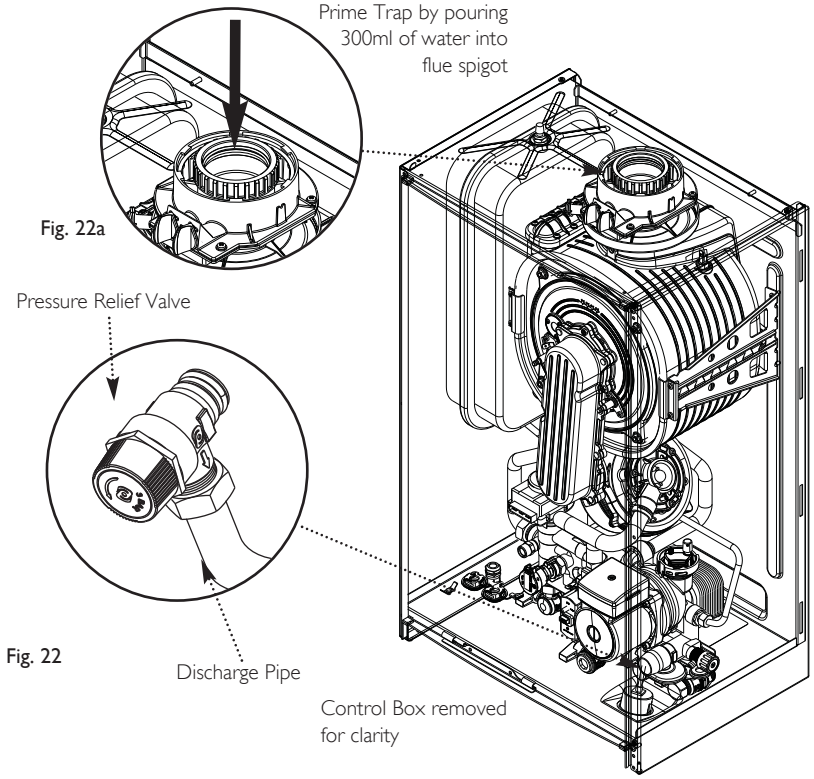
Prime Trap by pouring 300ml of water into flue spigot
Pressure Relief Valve
Discharge Pipe
Control Box removed for clarity

Fig. 22a

Fig. 22

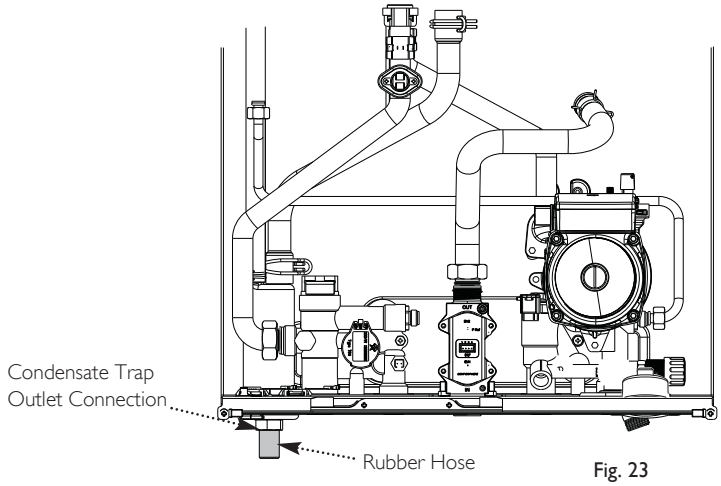

Fig. 23

9.0 Installation

9.3 Fitting The Boiler

1. Remove the sealing caps from the boiler connections.

NOTE: A small amount of water may drain from the boiler once the caps are removed.

2. Lift the boiler as indicated by the shaded areas. The boiler should be lifted by TWO PEOPLE. Engage the mounting bracket at the top rear of the boiler on the wall plate (Fig. 21) (see **Safe Manual Handling** page 5).

3. **Insert the sealing washers between the valves and pipes on the wall plate and the boiler connections. Tighten all the connections.**

9.4 Fitting the Safety Pressure Relief Discharge Pipe (Fig. 22)

1. Remove the discharge pipe from the kit.

2. Determine the routing of the discharge pipe in the vicinity of the boiler. Make up as much of the pipework as is practical, including the discharge pipe supplied.

IMPORTANT: Make all soldered joints before connecting to the pressure relief valve. The relief valve is intentionally angled to the right of the boiler. DO NOT adjust the position of the valve. The discharge pipe must be installed before pressurising the system.

3. The pipework must be at least 15mm diameter and run continuously downwards to a discharge point outside the building. See section 6.7 for further details.

4. Utilising one of the sealing washers, connect the discharge pipe to the adaptor and tighten the nut hand tight, plus 1/4 turn to seal.

5. Complete the discharge pipework and route it to the outside discharge point.

9.5 Condensate Drain (see section 7.7) (Fig. 23)

1. Using the short piece of rubber hose supplied, connect the condensate drain pipework to the boiler condensate trap outlet pipe. When connecting the hose, ensure that the condensate sump is not inadvertently unscrewed,

Ensure the discharge of condensate complies with any national or local regulations in force (see British Gas "Guidance Notes for the Installation of Domestic Gas Condensing Boilers" & HHIC recommendations).

2. The hose will accept 21.5mm (3/4in) plastic overflow pipe which should generally discharge internally into the household drainage system. If this is not possible, discharge into an outside drain is acceptable.

3. The boiler condensate trap should be primed by pouring approximately 300ml of water into the flue spigot (Fig. 22a). Do not allow any water to fall into the air inlet.

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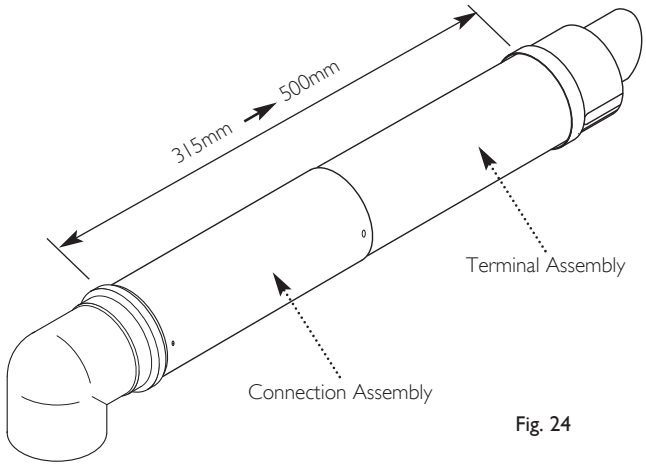

Fig. 24

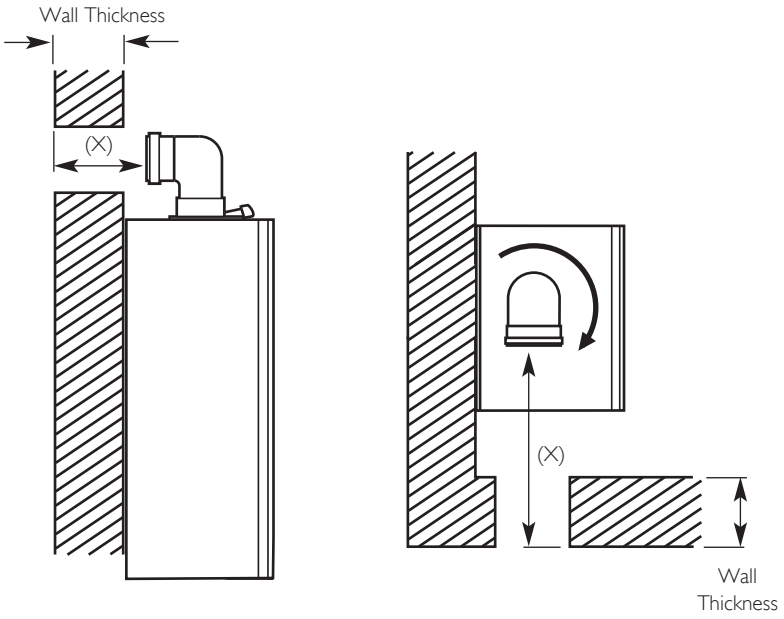

Fig. 25

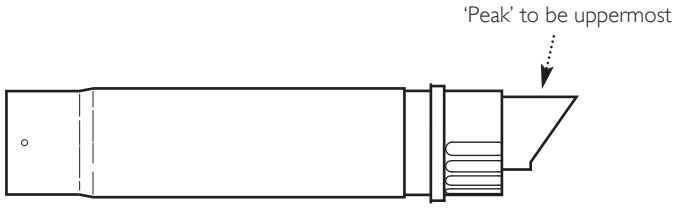

Fig. 26

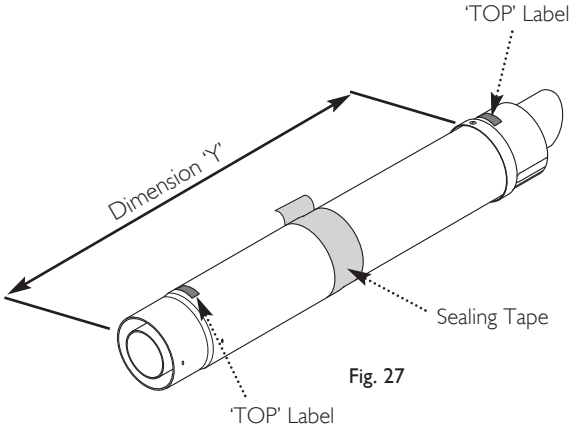

Fig. 27

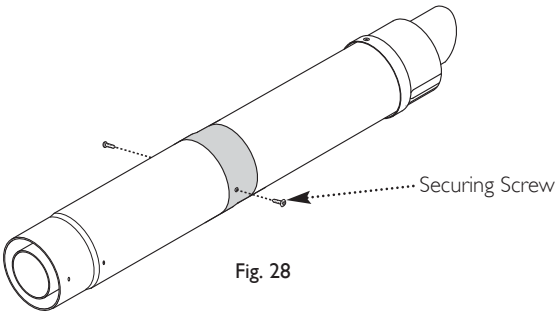

Fig. 28

9.0 Installation

9.6 Fitting The Flue

HORIZONTAL TELESCOPIC FLUE

1. There are two telescopic sections, the Terminal Assembly and the Connection Assembly, a roll of sealing tape and two self tapping screws. A 93° elbow is also supplied.

2. The two sections can be adjusted to provide a length between 315mm and 500mm (Fig. 24) when measured from the flue elbow (there is 50mm engagement into the elbow).

3. Locate the flue elbow on the adaptor at the top of the boiler. Set the elbow to the required orientation (Fig. 25).

NOTE: The flue elbow is angled at 93 degrees to ensure a fall back to the boiler.

4. Measure the distance from the outside wall face to the elbow. This dimension will be known as 'X' (Fig. 25).

5. If the distance from the flue elbow to the outside face of the wall ('X' in Fig. 25) is less than 250mm the Connection Assembly can be discarded and the Terminal Assembly fitted directly into the elbow.

6. In instances where the dimension 'X' (Fig. 25) is between 250mm and 315mm it will be necessary to shorten the Terminal Assembly by careful cutting to accommodate walls of these thicknesses.

7. To dimension 'X' add 50mm. This dimension to be known as 'Y'.

8. Adjust the two telescopic sections to dimension 'Y' and seal the joint with the tape provided (Fig. 27). Ensure that the labels marked 'TOP' on the Terminal and Connection Assemblies are uppermost.

9. Using the clearance holes in the Connection Assembly secure it to the Terminal Assembly using the screws supplied (Fig. 28).

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9.6 Fitting the Flue (Cont)

10. Remove the flue elbow and insert the flue through the hole in the wall.

11. Refit the elbow to the boiler adaptor, ensuring that it is pushed fully in (Fig. 29).

12. Two flue trims are supplied, one for internal use, the other for outside. The internal trim is packaged and identified as such - it should not be used externally.

13. It is recommended that if the internal trim is being used it is first fitted over the elbow to allow access to the securing screws and then manouvered into place against the wall.

14. Draw the flue back through the wall and engage it in the elbow. It may be necessary to lubricate to ease assembly of the elbow and flue (Fig. 30).

15. Ensure that the terminal is positioned with the slots to the bottom (Fig. 31). Secure the flue to the elbow with the screws supplied (Fig. 30).

16. Secure the elbow flue to the boiler adaptor with the screws supplied in the boiler fittings pack (Fig. 30).

IMPORTANT: It is essential that the flue terminal is fitted as shown to ensure correct boiler operation and prevent water entering the flue.

17. Make good between the wall and air duct outside the building, appropriate to the wall construction and fire rating.

18. If necessary fit a terminal guard (see Section 8.4).

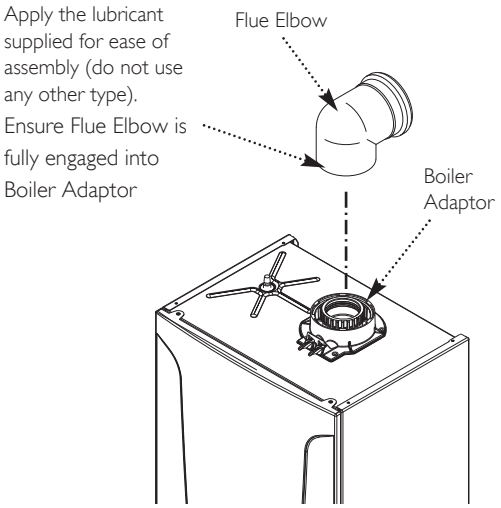
Apply the lubricant supplied for ease of assembly (do not use any other type).
Ensure Flue Elbow is fully engaged into Boiler Adaptor
Flue Elbow
Boiler Adaptor

Fig. 29

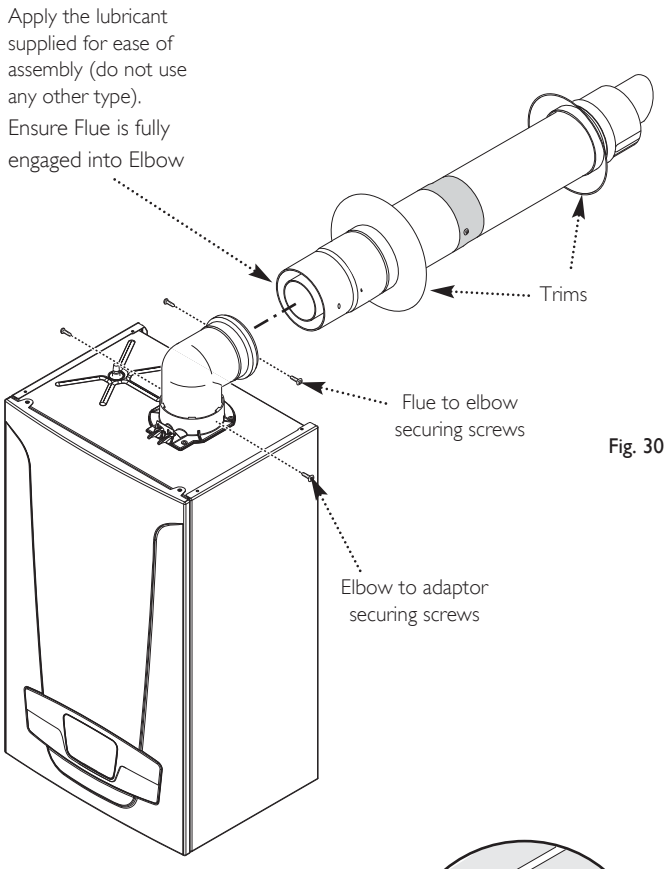
Apply the lubricant supplied for ease of assembly (do not use any other type).
Ensure Flue is fully engaged into Elbow
Trims
Flue to elbow securing screws
Elbow to adaptor securing screws

Fig. 30

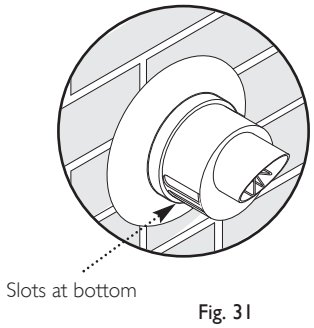

Fig. 31

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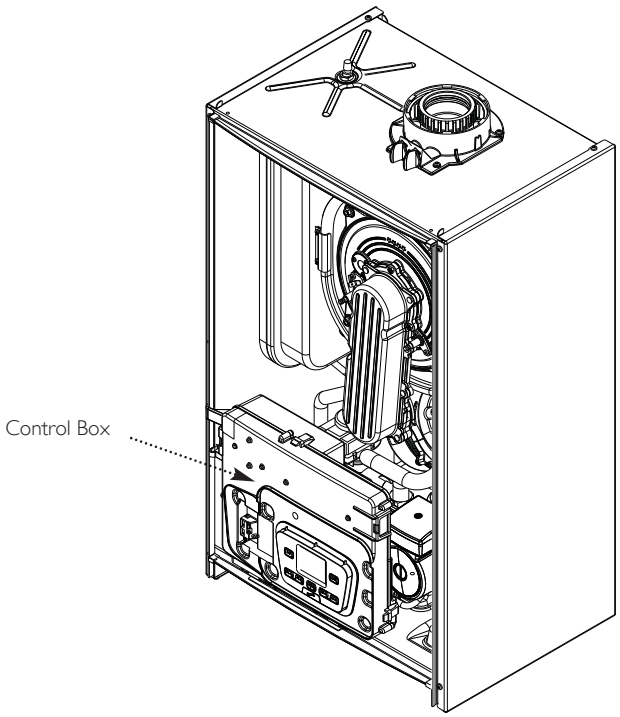


Fig. 34

Fig. 35

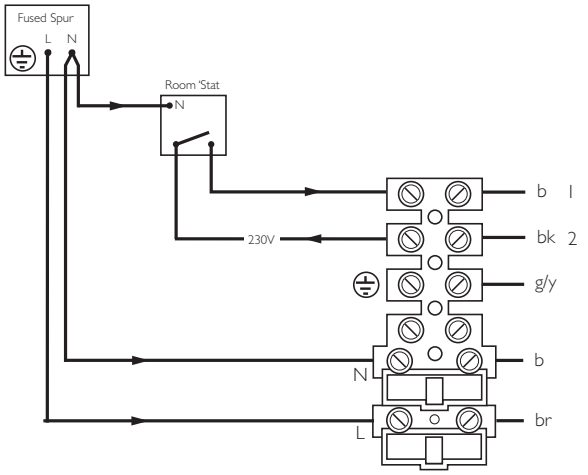
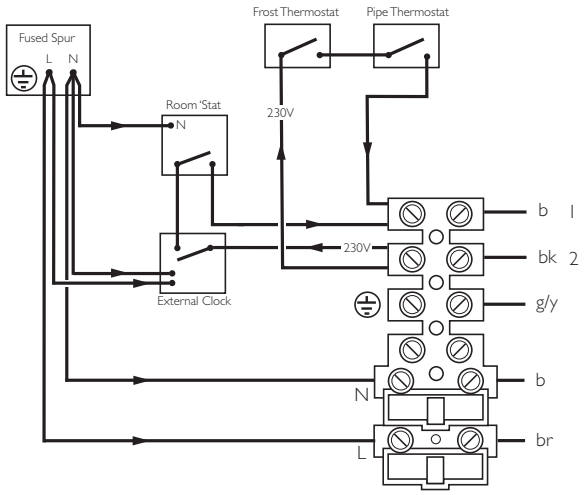


Fig. 36



NOTE: The 230V switched signal for external controls (Frost Stat - Room Stat - Timer) must always be taken from terminal 2 at the boiler. Live, Neutral and Earth to power these controls must be taken from the Fused Spur.

9.0 Installation

9.7 Making The Electrical Connections

1. Undo the securing screws and lift the case front panel off.

2. Disengage the securing tab and hinge the control box downwards. Undo the terminal block cover securing screw and remove the cover (Fig. 34).

3. Slacken the gland nut in the left of the boiler lower panel and pass the mains cable through it. Remove the grommet adjacent to the gland nut, pierce the diaphragm and insert the cable from the external control system.

4. Leave sufficient slack in the cables to allow the Control Box to be hinged fully open. Tighten the gland nut and refit the grommet.

5. Connect the Earth, Permanent Live and Neutral wires to the terminal strip.

NOTE: Both the Permanent Live and Neutral connections are fused.

6. Refer to the instructions supplied with the external control(s).

IMPORTANT: Any thermostat **MUST** be suitable for 230V switching.

7. Remove the link between terminals 1 & 2. The 230V supply at terminal 2 must be connected to the thermostat. The switched output from the thermostat must be connected to terminal 1. (Figs. 35 & 36). If the room thermostat being used incorporates an anticipator it MUST be wired as shown in Figs. 35 & 36.

NOTE: When only Low Voltage controls are being used (connected to Terminal M2) it is still necessary to remove the link wire !

8. Replace the terminal block cover.

9. See Section 18.0 for details of fitting the Optional Outdoor Sensor.

9.8 Preliminary Electrical Checks

1. Prior to commissioning the boiler preliminary electrical system checks should be carried out.

2. These should be performed using a suitable meter, and include checks for Earth Continuity,
Resistance to Earth, Short Circuit and Polarity.

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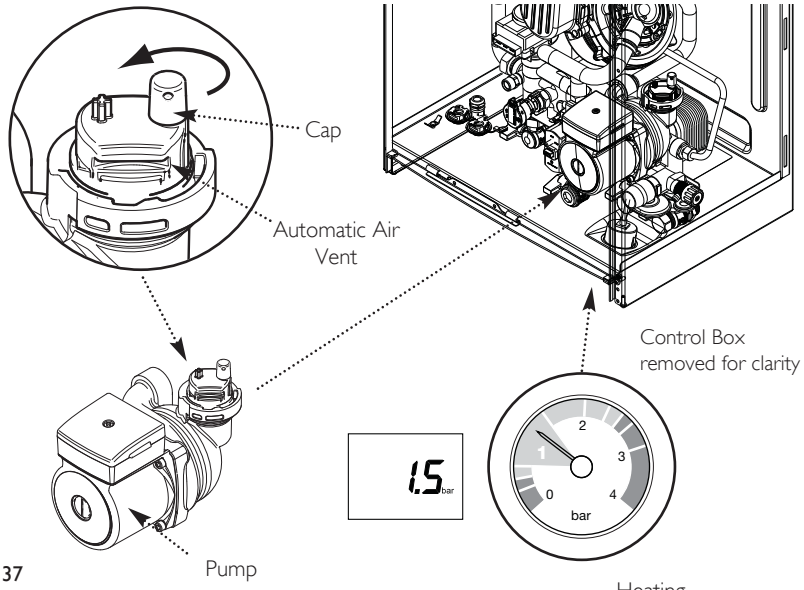


Fig. 37

Fig. 38 Heating Pressure Gauge

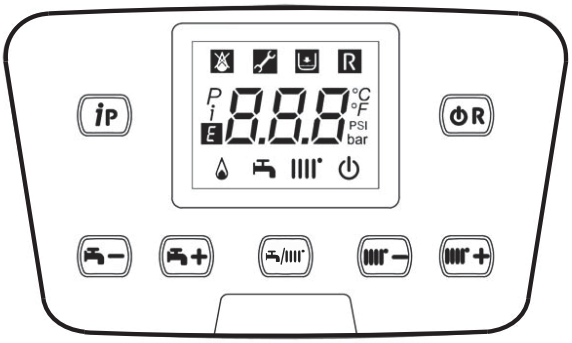
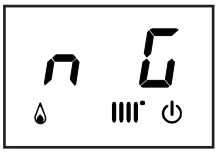


Fig. 39

Display showing Gas Type Recognition



IMPORTANT: The combustion for this appliance has been checked, adjusted and preset at the factory for operation on the gas type specified on the appliance data plate. No measurement of the combustion is necessary.
Do not adjust the air/gas ratio valve.
During the Gas Type Check Function the combustion ratio will increase for a short time while the gas type is established.

FUNCTION INTERRUPTION
If either De-aeration or Gas Check is interrupted by a fault e.g. low water pressure (E118) or air in the gas supply (E128 or E133) the fault must be rectified and the function reactivated. During De-aeration, if water pressure is lost, repressurising to 1.0 bar will allow the function to continue. Whilst the Gas Type Check is being performed if water pressure is lost the function can be reactivated by repressurising then pressing i P & + together and holding for at least 6 seconds. If a gas supply fault occurs ⏻ R must be pressed before i P & +.

10.0 Commissioning

10.1 Commissioning the Boiler

1. Reference should be made to BS:EN 12828, 12831 & 14336 when commissioning the boiler. Ensure that the trap has been primed -see Section 9.5.3.

2. At the time of commissioning, complete all relevant sections of the Benchmark Checklist at the rear of this publication.

3. Open the mains water supply to the boiler and all hot water taps to purge the DHW system.

4. Ensure that the filling loop is connected and open, then open the heating flow and return valves on the boiler. Ensure that the cap on the automatic air vent on the pump body is opened (Fig. 37).

5. The system must be flushed in accordance with BS 7593 (see Section 6.2) and the flushing agent manufacturers instructions.

6. Pressurise the system to 1.5 bar (Fig. 38) then close and disconnect the filling loop.

7. Test for gas tightness, turn the gas supply on and purge according to in GB BS 6891 and in IE I.S. 813 "Domestic Gas Installations".

De-Aeration Function

8. When power is supplied to the boiler for the first time the software will be displayed, followed by 000. However if ⏻ is shown, press ⏻ R for 2 to 4 seconds. 000 will now be displayed.

9. Press i P & + together and hold for at least 6 seconds. The 'De-Aeration' Function will be activated and *'On'* displayed.

10. The boiler pump will run for up to 10 minutes during which time the diverter valve will switch between heating & hot water. This will purge air from the system. The display will show 3 12.

Gas Type Check

11. Once de-aeration is complete the boiler will go automatically to first fire-up and run at the Ignition Phase fan speed for 3 or 4 minutes to check the gas type (N.G. or Propane L.P.G.). The boiler software checks the combustion value against the set value. 000 will be displayed, alternating with a figure representing the Ignition Phase speed, e.g. *'33'* or *'43'* (Note: Each boiler model will display a different figure).

12. The boiler is factory set for Natural Gas. On a Natural Gas Supply n G will be displayed and the boiler is ready for the Inlet Pressure & Gas Rate to be checked (Section 10.2).

13. IMPORTANT - In cases where the supplied gas is Propane gas LPG will be displayed. Press i P for at least 6 seconds to confirm that this is the intended gas type for the installation.

14. IF THE BOILER IS TO BE OPERATED ON PROPANE A SUITABLE PERMANENT MARKER PEN MUST BE USED TO ALTER THE 'GAS SETTING INFORMATION' LABEL ADJACENT TO THE DATA LABEL!

15. Having checked:
- That the boiler has been installed in accordance with these instructions.
- The integrity of the flue system and the flue seals.
- The integrity of the boiler combustion circuit and the relevant seals.

Proceed to put the boiler into operation as follows:

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